



Color Atlas of

CLINICAL ANATOMY OF THE DOG & CAT

SECOND EDITION

J S BOYD



Colour Atlas of Clinical Anatomy of the Dog and Cat - Softcover Version, 2nd Edition

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¹ 1 INTRODUCTION

Without wishing to appear too pedantic, the consistent use of basic anatomical terminology is of paramount importance to permit proper communication not only among veterinary anatomists themselves, but also between anatomists and clinicians. To this end, a common nomenclature has been devised, *Nomina Anatomica Veterinaria* (NAV), that has greatly assisted in clarifying the channels of communication.

At first sight, the system may seem laboured, since the original NAV is in Latin, but it is quite permissible to use the same terms and names translated into English, as happens in many instances throughout the atlas. However, where muscles of the body appear in key lists, the Latin form has been retained to avoid a conflict in terminology. On a few occasions, an alternative term may appear after the standard NAV version, where an older name for a structure is still so widely used that it is regarded as common parlance.

When discussing topographical anatomy, the need for uniform description of both direction and position also becomes obvious. The photographs of the live dog in this chapter are annotated to demonstrate the standard directional and positional terms (1-3). Also included are a small number of regional names for specific areas of the body and limbs. Adjectives that have common usage in human anatomy, such as 'anterior', 'posterior', 'superior' and 'inferior', should not be employed in veterinary anatomy, except in a limited number of instances, to describe certain structures in the head region (e.g., within the eye or the brain).

In the live animal, standing erect on all four limbs, structures located towards the back (*dorsum*) of the animal are said to be 'dorsal' in position; this applies to the trunk, head and even the tail. The opposite of this position is termed 'ventral', describing structures that lie closest to the belly (*venter*) of the animal. Any structures that are located towards the head (*cranium*) are referred to as 'cranial', while those located towards the tail (*cauda*) are said to be 'caudal'. This system of identification requires finer definition in the head region itself, where the term 'rostral' is used for structures located closer to the muzzle (*rostrum*), rather than the broader term 'cranial'. However, the contrary direction in the head region is still termed 'caudal'.

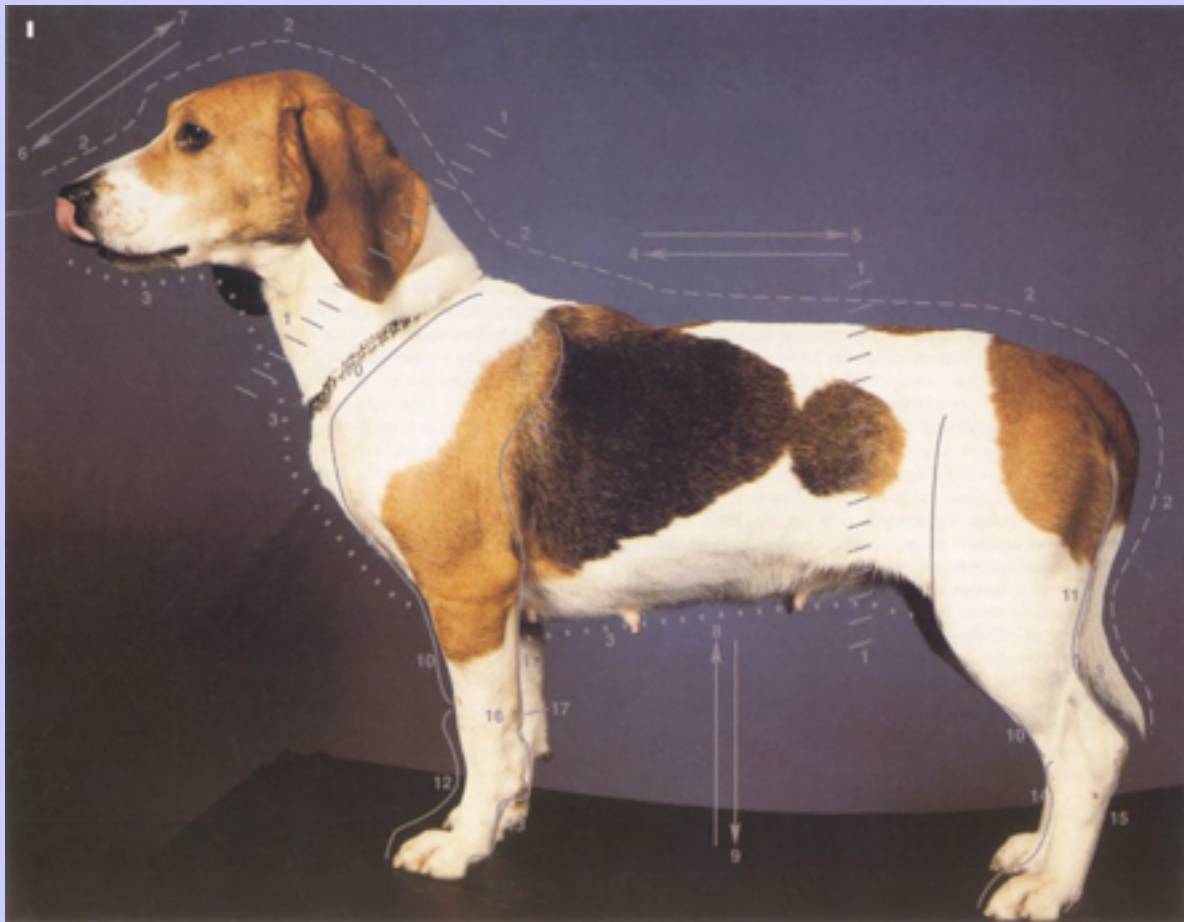
The median (*medianus*) plane passes through the animal from head to tail, along the line of the vertebral column (*axis*), and divides the whole body into two symmetrical halves. Planes passing to either side of the median plane but parallel to it are referred to as 'sagittal'. However, sometimes, if the plane is close to the median, it is called 'paramedian'. The structures that lie closer to the median plane are said to be 'medial', while those that lie towards the outer side or flank (*latus*) of the animal are classified as 'lateral'. Sections of the head and trunk, that are parallel to the back (*dorsum*) of the animal are said to be in the dorsal plane, whereas sections made at right angles to the axis of the body are referred to as being 'transverse'.

The limbs require further definition and interpretation because their position may alter relative to the trunk. The proximal region of a limb is that closer to the trunk, while the area further from the trunk is distal. In the proximal region of the thoracic and pelvic limbs (i.e., down to the proximal limit of the carpus and tarsus) the area closer to the 'front' of the limb is cranial in contrast to the area closer to the 'rear', which is caudal. Distal to the carpus in the thoracic limb, the continuation of the cranial surface is termed 'dorsal' and that of the caudal surface is 'palmar'. With the pelvic limb, the equivalent terms for areas distal to the tarsus are 'dorsal' and 'plantar'. There is also a notional central axis running the length of each limb, and any section perpendicular to it is termed 'transverse'. If a structure in the limb lies closer to the central axis, it is 'axial' in position, in contrast to structures lying away from the central axis, which are 'abaxial'.

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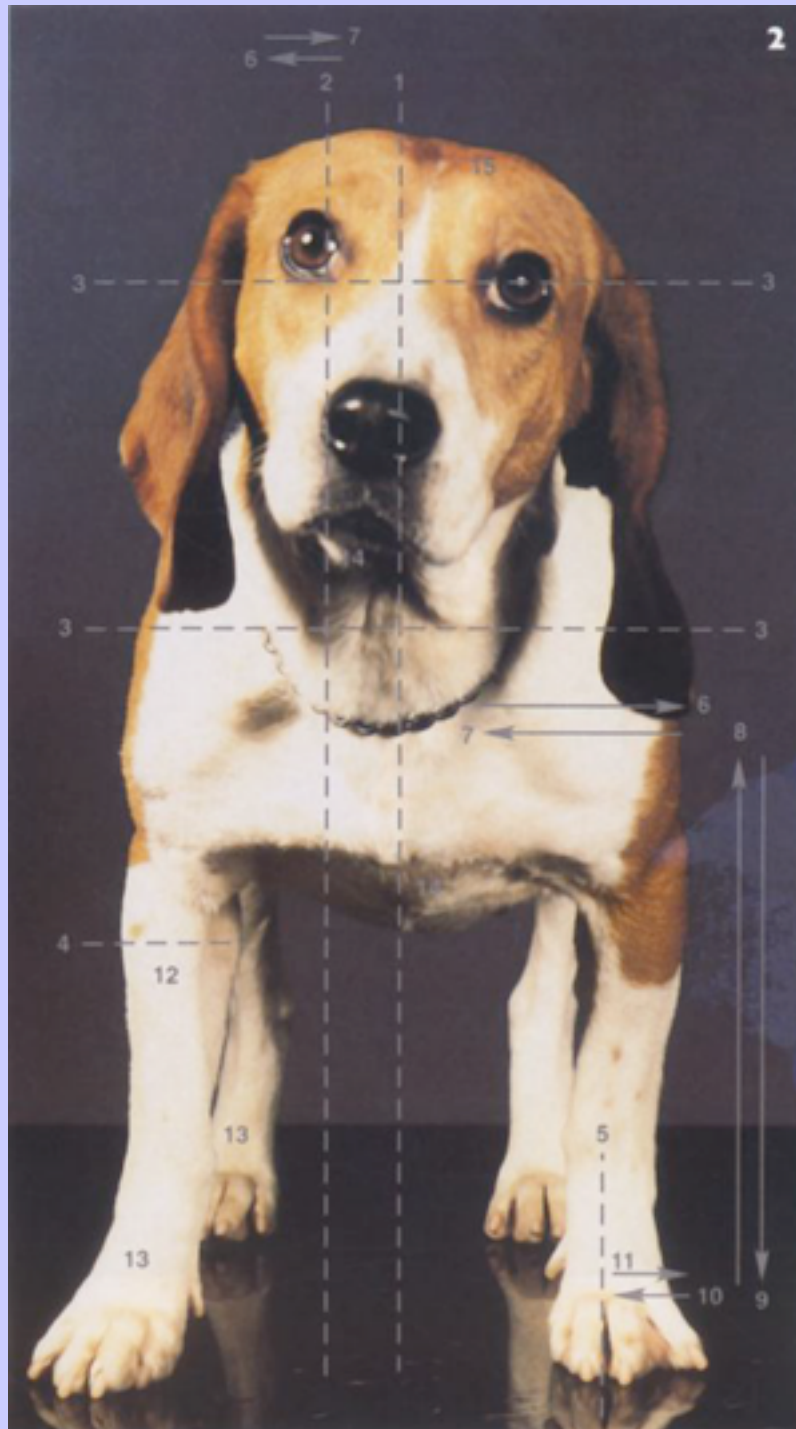
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- 1 Lateral aspect of a standing live dog. The oblique dashes indicate the transverse plane, and the straight dashes, dots and continuous lines indicate the position and direction. Note, in particular, the specific terms for the head and the distal limbs.



1	Transverse plane of trunk	10	Cranial	} proximal limb
2	Dorsal	11	Caudal	
3	Ventral	12	Dorsal	} thoracic limb
4	Cranial	13	Palmar	
5	Caudal	14	Dorsal	} pelvic limb
6	Rostral	15	Plantar	
7	Caudal	16	Lateral	} limb
8	Proximal	17	Medial	
9	Distal			

- 2 Cranial aspect of a standing live dog. The dotted lines indicate the anatomical planes of the body, and the arrows indicate the position and direction. Aspects of the head, trunk and limbs are marked by separate numbers.



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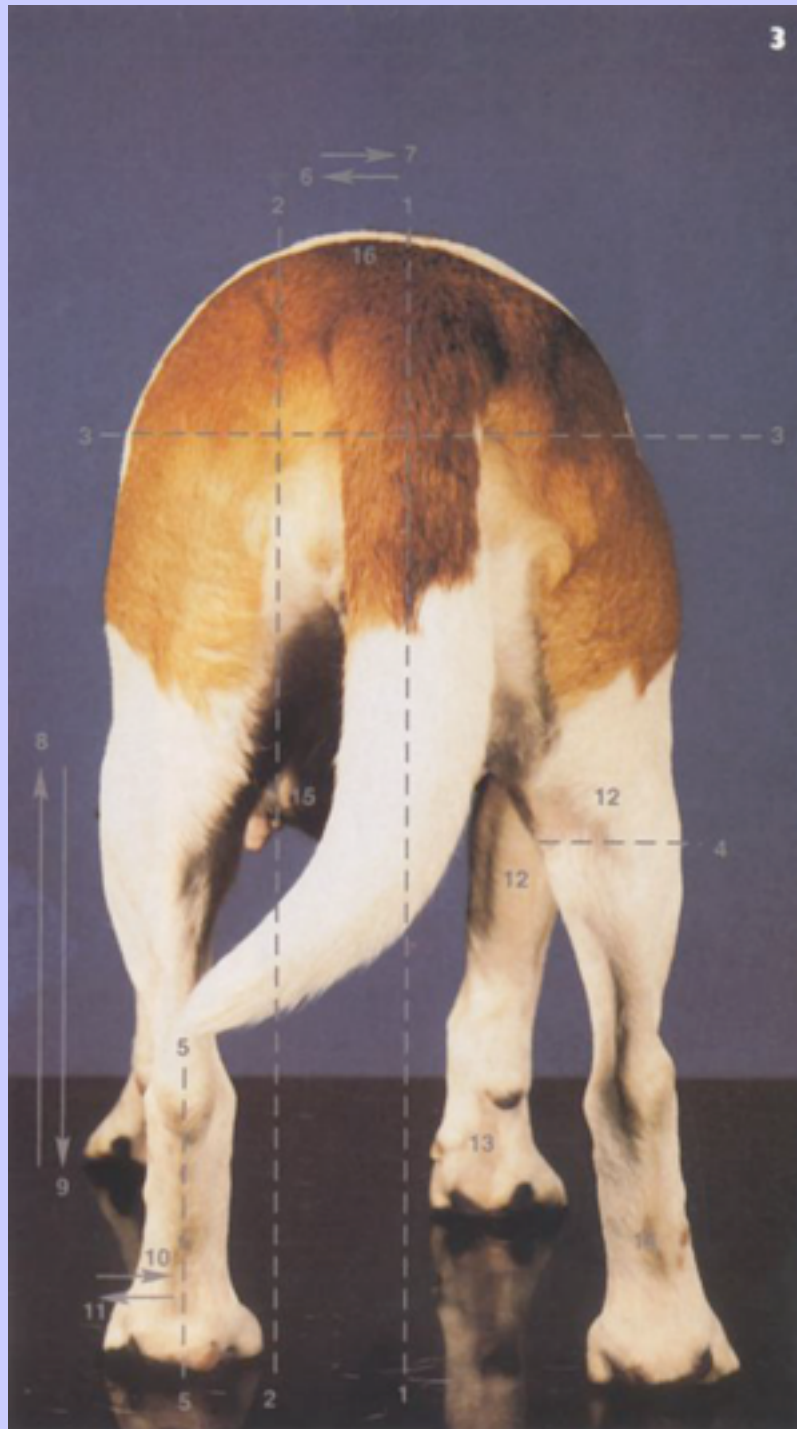
1 Median plane	8 Proximal	} limb
2 Sagittal plane	9 Distal	
3 Dorsal plane	10 Axial	} limb
4 Transverse plane	11 Abaxial	
5 Axial plane	12 Cranial	} limb
6 Lateral	13 Dorsal	
7 Medial	14 Ventral	} trunk and head
	15 Dorsal	

1.0.1

Clinical Note

Note that the term paramedian is sometimes applied to a sagittal plane that is close to the median plane.

- 3 Caudal aspect of a standing live dog. The dotted lines indicate the anatomical planes of the body, and the arrows indicate the position and direction. Aspects of the trunk and limbs are marked by separate numbers.



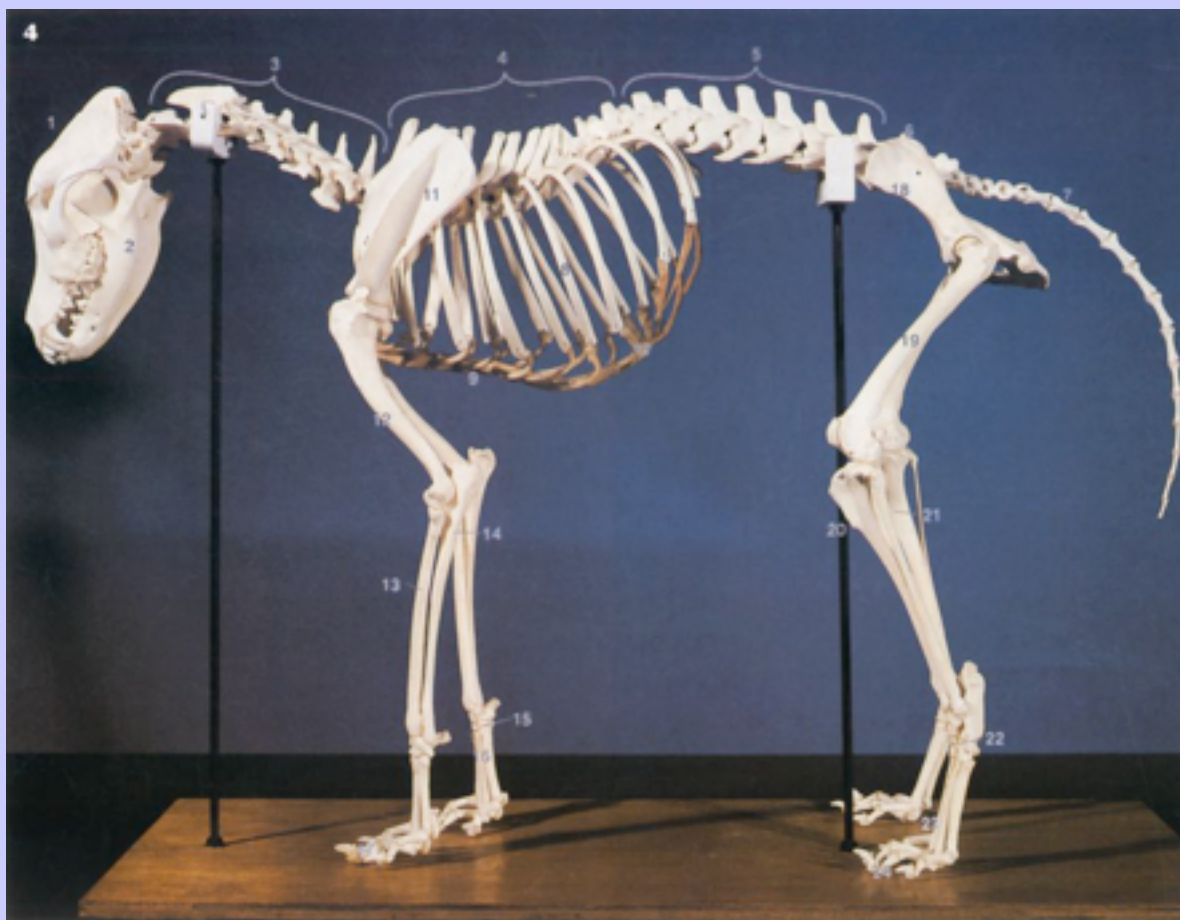
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1 Median plane		9 Distal	
2 Sagittal plane		10 Axial	
3 Dorsal plane		11 Abaxial	limbs
4 Transverse plane	of limb	12 Caudal	
5 Axial plane		13 Palmar	
6 Lateral	limb	14 Plantar	
7 Medial		15 Ventral	trunk
8 Proximal		16 Dorsal	

11

12

4 Lateral aspect of an articulated standing skeleton of a dog.



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- 1 Skull
- 2 Mandible
- 3 Cervical vertebrae
- 4 Thoracic vertebrae
- 5 Lumbar vertebrae
- 6 Sacrum
- 7 Caudal vertebrae
- 8 Ribs
- 9 Sternum
- 10 Costal arch
- 11 Scapula
- 12 Humerus
- 13 Radius
- 14 Ulna
- 15 Carpus
- 16 Metacarpus
- 17 Phalanges
- 18 Ossa coxae
- 19 Femur
- 20 Tibia
- 21 Fibula
- 22 Tarsus
- 23 Metatarsus
- 24 Phalanges

12

5 Cranial aspect of an articulated standing skeleton of a dog.

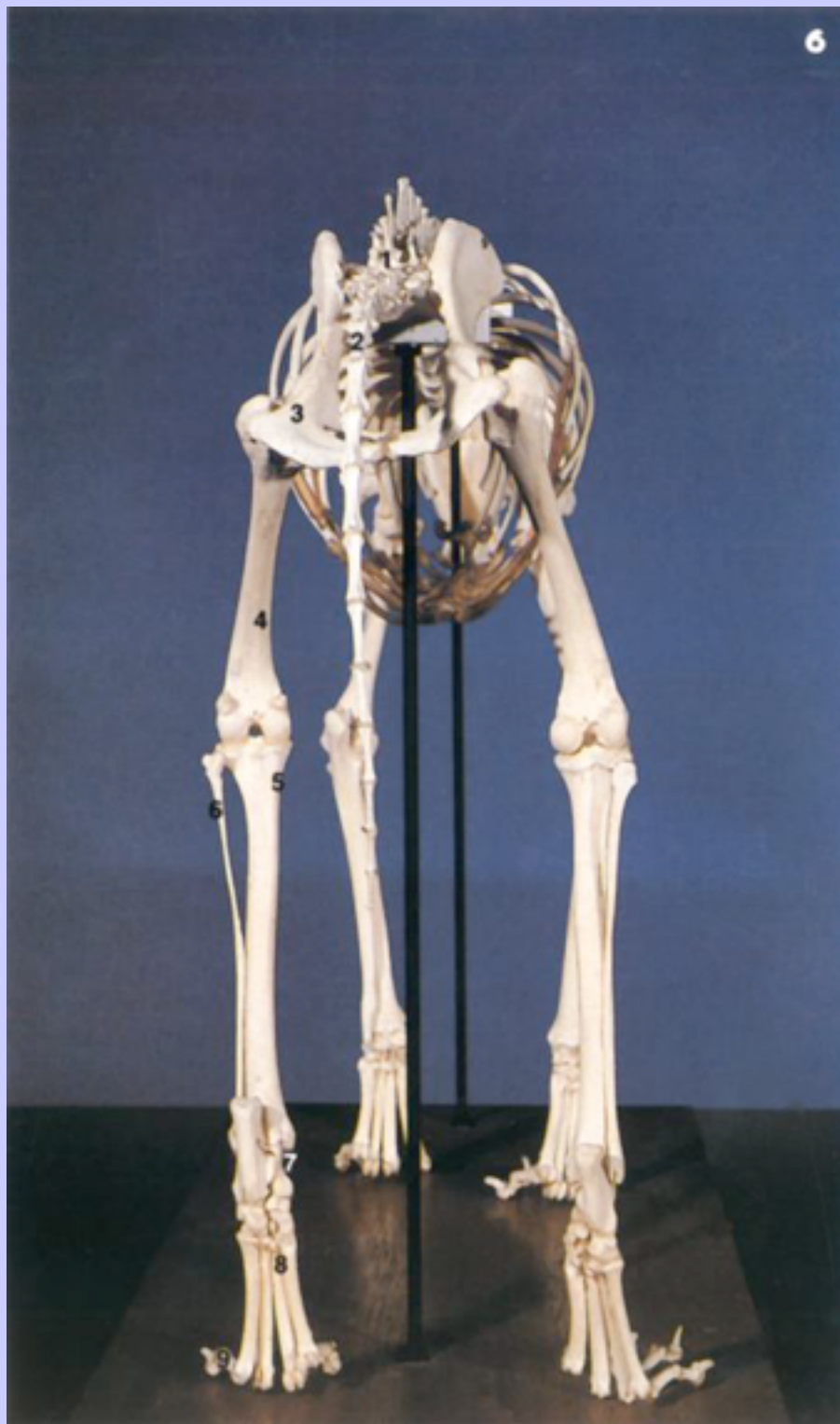
13



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- 1 Skull
- 2 Ribs
- 3 Sternum
- 4 Scapula
- 5 Humerus
- 6 Radius
- 7 Ulna
- 8 Carpus
- 9 Metacarpus
- 10 Phalanges of manus

6 Caudal aspect of an articulated standing skeleton of a dog.



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- 1 Sacrum
- 2 Caudal vertebrae
- 3 Ossa coxae
- 4 Femur
- 5 Tibia
- 6 Fibula
- 7 Tarsus
- 8 Metatarsus
- 9 Phalanges of pes

² 2 HEAD AND NECK

Dealing with the structures of the head and neck, this chapter uses the live animal to indicate the palpable landmarks of the region, while the osteological features are demonstrated using bony specimens and radiographs. Soft tissue structures are illustrated in detail, with a series of prepared dissections, and their topographical relationships are displayed by means of additional cross-sectional specimens and radiography.

7 Lateral aspect of the head and neck region of a live dog, demonstrating palpable landmarks.



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- 1 Incisive bone
- 2 Infraorbital foramen
- 3 Medial commissure of eyelids
- 4 Puncta lacrimale of upper lid (palpebra superior)
- 5 Puncta lacrimale of lower lid (palpebra inferior)
- 6 Third eyelid
- 7 Angular vein of the eye
- 8 Lateral commissure of eyelids
- 9 Maxilla
- 10 Zygomatic process of frontal bone
- 11 M. temporalis
- 12 Temporal line
- 13 External sagittal crest
- 14 External occipital protuberance
- 15 Pinna of ear
- 16 Zygomatic arch
- 17 M. masseter
- 18 Angular process of mandible
- 19 Position of mandibular lymph nodes
- 20 Body of mandible
- 21 Commissure of lips
- 22 Tongue (extruded)
- 23 Larynx
- 24 External jugular (site for venepuncture)

- 8 Cranial aspect of the head and neck region of a live dog, demonstrating palpable landmarks.



- 1 Planum nasale
- 2 Nares (nostril)
- 3 Philtrum
- 4 Upper lip (labia superior)
- 5 Tactile hairs
- 6 Incisive bone
- 7 Body of mandible

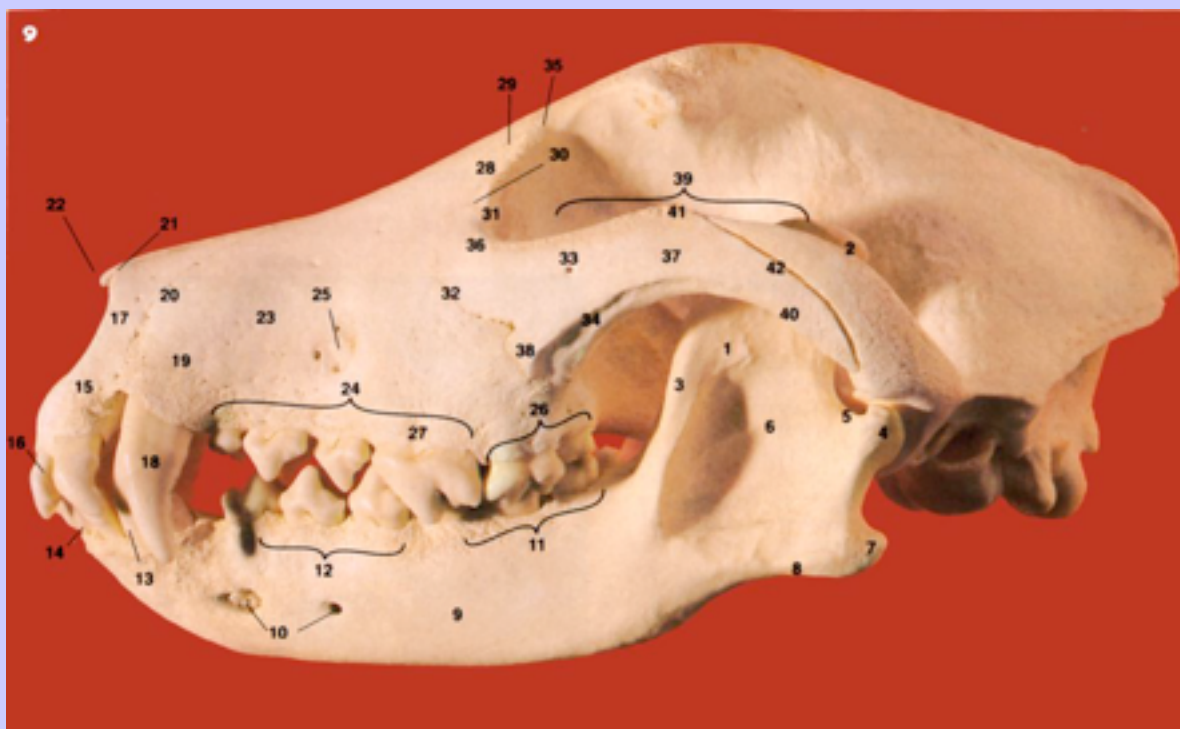
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- 8 Nasal bones
- 9 Maxilla
- 10 Infraorbital foramen
- 11 Medial commissure of eyelids
- 12 Third eyelid
- 13 Lateral commissure of eyelid
- 14 Zygomatic arch
- 15 Zygomatic process of frontal bone
- 16 Frontal bone
- 17 M. temporalis
- 18 M. masseter
- 19 Pinna of ear

15

9 Lateral aspect of the skull and mandible of a bull terrier dog.

16



- 1 Ramus of mandible
- 2 Coronoid process
- 3 Coronoid crest
- 4 Condylod process
- 5 Mandibular notch
- 6 Masseteric fossa
- 7 Angular process
- 8 Masseteric line
- 9 Body of mandible
- 10 Mental foramina
- 11 Lower molar teeth
- 12 Lower premolar teeth
- 13 Lower canine tooth
- 14 Lower incisor teeth
- 15 Incisive bone
- 16 Upper incisor teeth
- 17 Nasal process
- 18 Upper canine tooth
- 19 Alveolus of canine tooth
- 20 Incisivomaxillary suture
- 21 Nasoincislve suture
- 22 Nasal bone
- 23 Maxilla
- 24 Upper premolar teeth
- 25 Infraorbital foramen
- 26 Upper molar teeth

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- 27 Alveolar juga
- 28 Frontal process
- 29 Frontomaxillary suture
- 30 Lacrimomaxillary suture
- 31 Lacrimal bone
- 32 Zygomaticomaxillary suture
- 33 Infraorbital margin
- 34 Masseteric margin
- 35 Groove for angular vein of eye
- 36 Lacrimozygomatic suture
- 37 Zygomatic bone
- 38 Maxillary process
- 39 Zygomatic arch
- 40 Temporal process
- 41 Frontal process
- 42 Temporozygomatic suture

16

10 Lateral aspect of the skull and mandible of a cat.

17



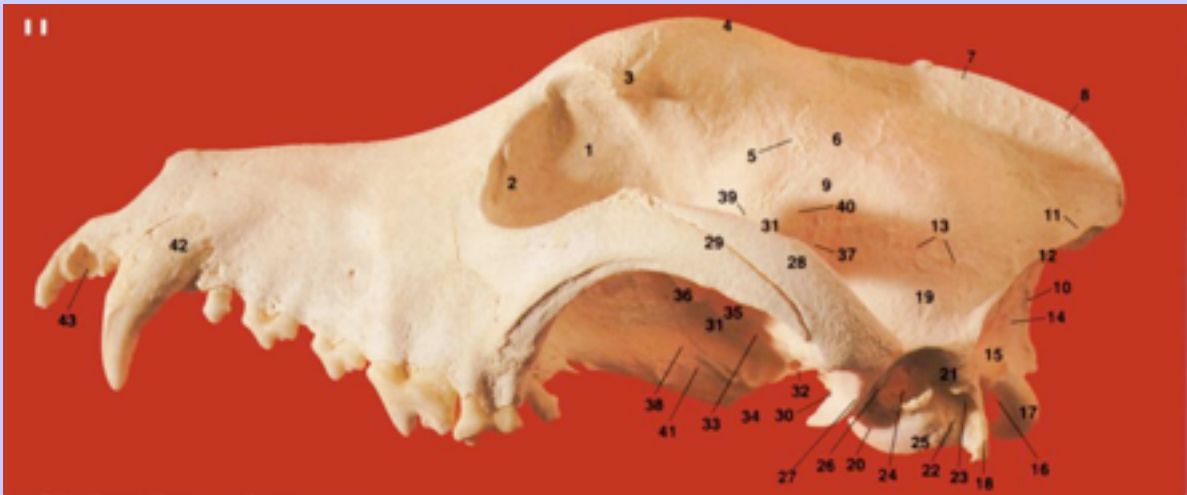
- 1 Incisive bone
- 2 Nasal bone
- 3 Infraorbital foramen
- 4 Fossa for lacrimal sac
- 5 Lacrimal bone
- 6 Zygomatic bone
- 7 Frontal process of zygomatic bone
- 8 Zygomatic process of frontal bone
- 9 Frontal bone
- 10 Parietal bone
- 11 Temporal line
- 12 Temporal fossa
- 13 Squamous temporal bone
- 14 External occipital protuberance
- 15 Nuchal crest
- 16 Occipital bone
- 17 Dorsal condyloid fossa
- 18 Occipital condyle
- 19 Jugular process
- 20 Ventral condyloid fossa
- 21 Mastoid process
- 22 Stylomastoid foramen
- 23 Tympanic bulla
- 24 External acoustic meatus
- 25 Maxilla
- 26 Coronoid process

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- 27 Condylod process
- 28 Angular process
- 29 Masseteric fossa
- 30 Body of mandible
- 31 Mental foramina

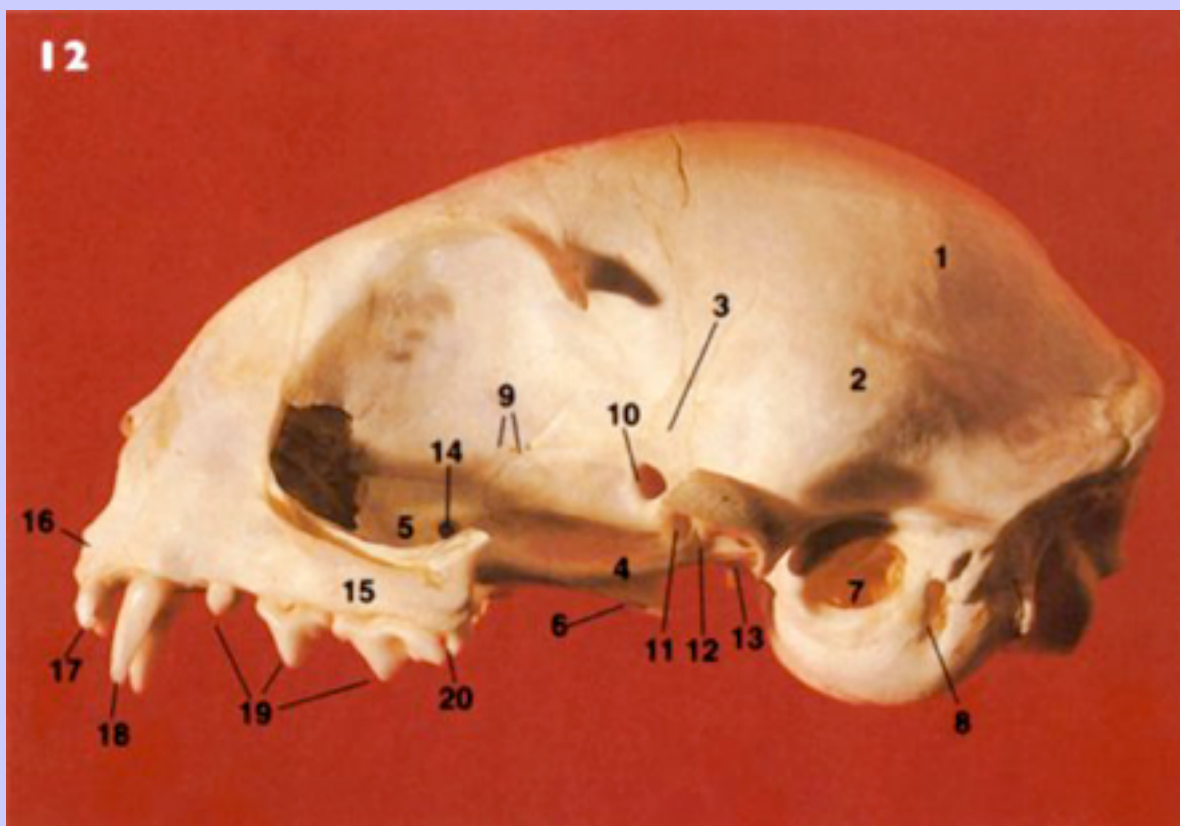
17
18

11 Lateral aspect of the skull of a dog, without the mandible.



- | | | | |
|---|-----------------------------------|-----------------------------|---|
| 1 Frontal bone | 11 Occipitoparietal suture | 23 Stylomastoid foramen | 35 Orbital fissure |
| 2 Fossa for lacrimal gland | 12 Nuchal line | 24 External acoustic meatus | 36 Orbital canal |
| 3 Zygomatic process of I | 13 Squamous suture | 25 Tympanic bulla | 37 Sphenosquamous suture |
| 4 Temporal line | 14 Mastoid foremen | 26 Retroarticular foramen | 38 Sphenopalatine suture |
| 5 Frontoparietal suture (coronal suture) | 15 Dorsal condyloid fossa | 27 Retroarticular process | 39 Sphenofrontal suture |
| 6 Parietal bone | 16 Ventral condyloid fossa | 28 Zygomatic process | 40 Sphenoparietal suture |
| 7 External sagittal crest | 17 Occipital condyle | 29 Temporozygomatic suture | 41 Pterygosphenoid suture |
| 8 Interparietal process and parietointerparietal suture | 18 Jugular process | 30 Mandibular fossa | 42 Alveolus of canine tooth (lateral wall partially resected) |
| 9 Temporal fossa | 19 Squamous part of temporal bone | 31 Sphenoid bone | 43 Alveolus of incisor tooth |
| 10 Occipital bone | 20 Tympanic bone | 32 Caudal alar foramen | |
| | 21 Mastoid process | 33 Rostral alar foramen | |
| | 22 Tympano-occipital suture | 34 Pterygoid bone | |

12 Lateral aspect of the skull of a cat. The zygomatic arch has been removed from the left side.



- 1 Parietal bone
- 2 Squamous temporal bone
- 3 Wing of basisphenoid bone
- 4 Presphenoid bone
- 5 Palatine bone
- 6 Pterygoid bone
- 7 External acoustic meatus
- 8 Stylomastoid foramen
- 9 Ethmoid foramina
- 10 Optic canal

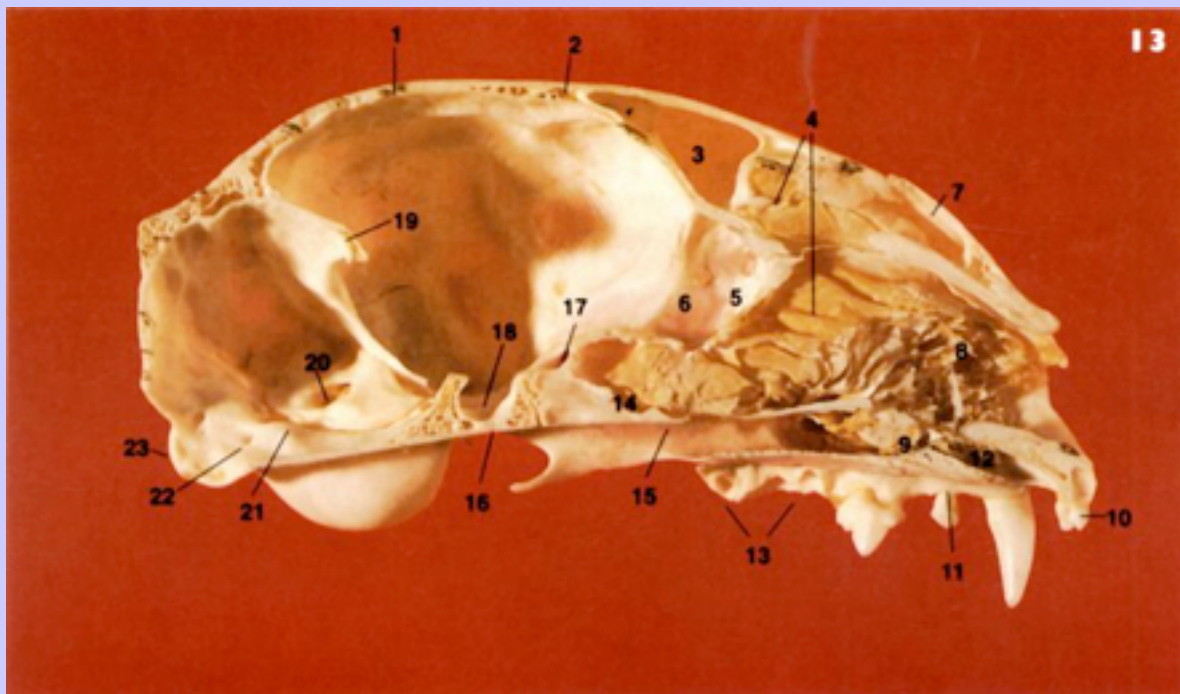
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- 11 Orbital fissure
- 12 Rostral alar foramen
- 13 Caudal alar foramen
- 14 Sphenopalatine foramen
- 15 Maxilla
- 16 Incisive bone
- 17 Incisor teeth
- 18 Canine tooth
- 19 Premolar teeth
- 20 Molar tooth

18

13 Medial aspect of a sagittal section of the left half of the skull of a cat.

19

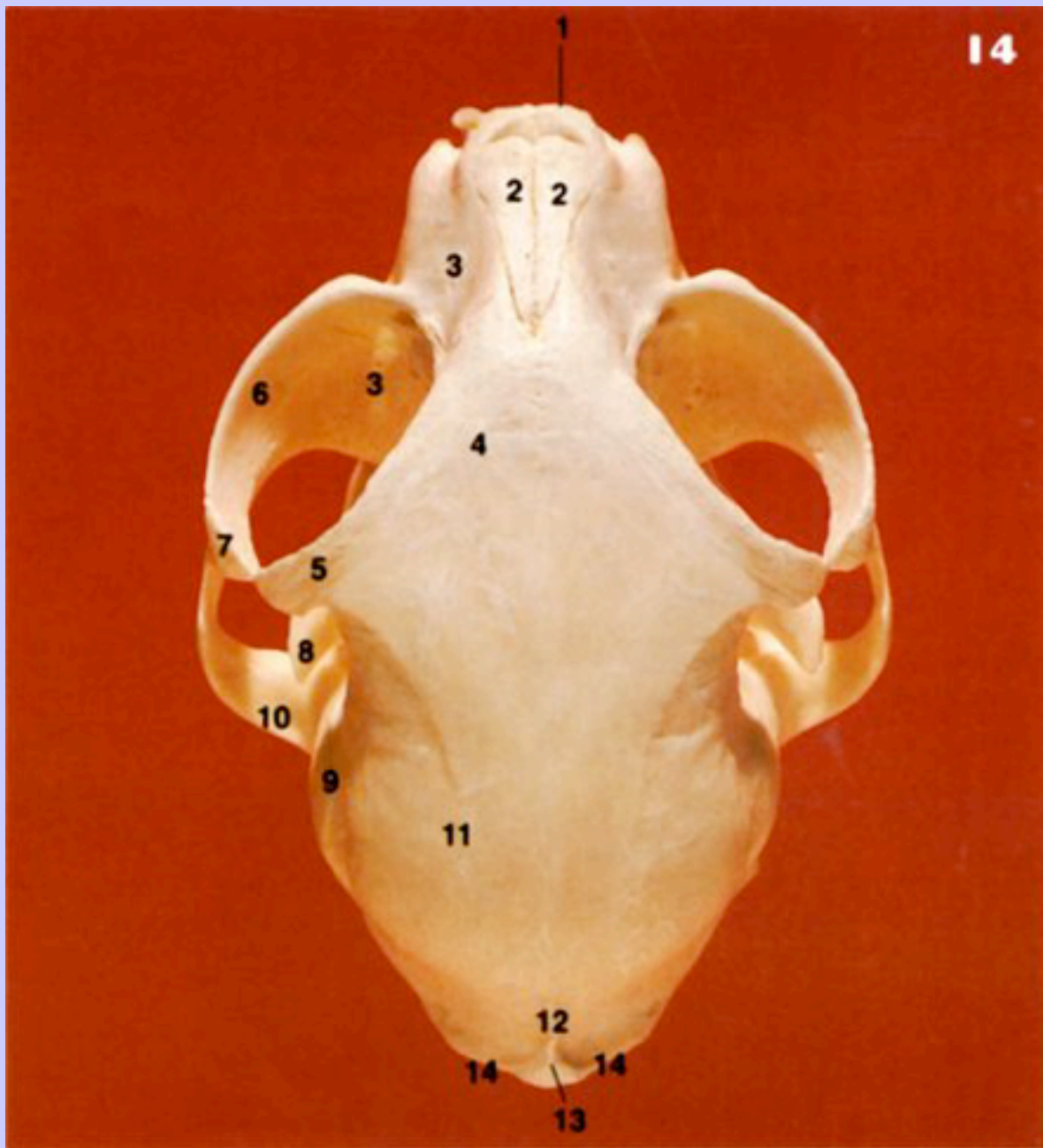


- 1 Parietal bone
- 2 Frontal bone
- 3 Frontal sinus

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- 4 Ethmoturbinates
- 5 Cribriform plate
- 6 Ethmoidal foramina
- 7 Nasal bone
- 8 Dorsal nasal concha
- 9 Ventral nasal concha
- 10 Incisive bone
- 11 Maxilla
- 12 Vomer
- 13 Alveoli of third premolar and first molar
- 14 Sphenoidal sinus
- 15 Presphenoid bone
- 16 Basisphenoid bone
- 17 Optic canal
- 18 Dorsum sellae
- 19 Tentorium osseum
- 20 Internal acoustic meatus
- 21 Jugular foramen
- 22 Hypoglossal canal
- 23 Occipital bone

14 Dorsal aspect of the skull of a cat.



- 1 Incisive bone
- 2 Nasal bone
- 3 Maxilla

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- 4 Frontal bone
- 5 Zygomatic process of frontal bone
- 6 Zygomatic bone
- 7 Frontal process
- 8 Coronoid process of mandible
- 9 Temporal bone
- 10 Zygomatic process of temporal bone
- 11 Parietal bone
- 12 Interparietal bone
- 13 Sagittal crest
- 14 Occipital bone

19

15 Lateral radiograph of the head of a dog.

20



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- 1 Mandible
- 2 Lower canine
- 3 First lower molar
- 4 Mental foramina
- 5 Mandibular canal
- 6 Angular process
- 7 Condylod process
- 8 Coronoid process
- 9 Incisive bone
- 10 Nasal bone
- 11 Frontal bone
- 12 Maxilla
- 13 Upper canine
- 14 Fourth upper premolar
- 15 Dorsal nasal concha
- 16 Ventral nasal concha
- 17 Dorsal nasal meatus
- 18 Ventral nasal meatus
- 19 Maxillary sinus
- 20 Hard palate
- 21 Infraorbital foramen
- 22 Orbit
- 23 Temporal process of zygomatic bone
- 24 Zygomatic process of temporal bone
- 25 Frontal sinus
- 26 Sagittal crest

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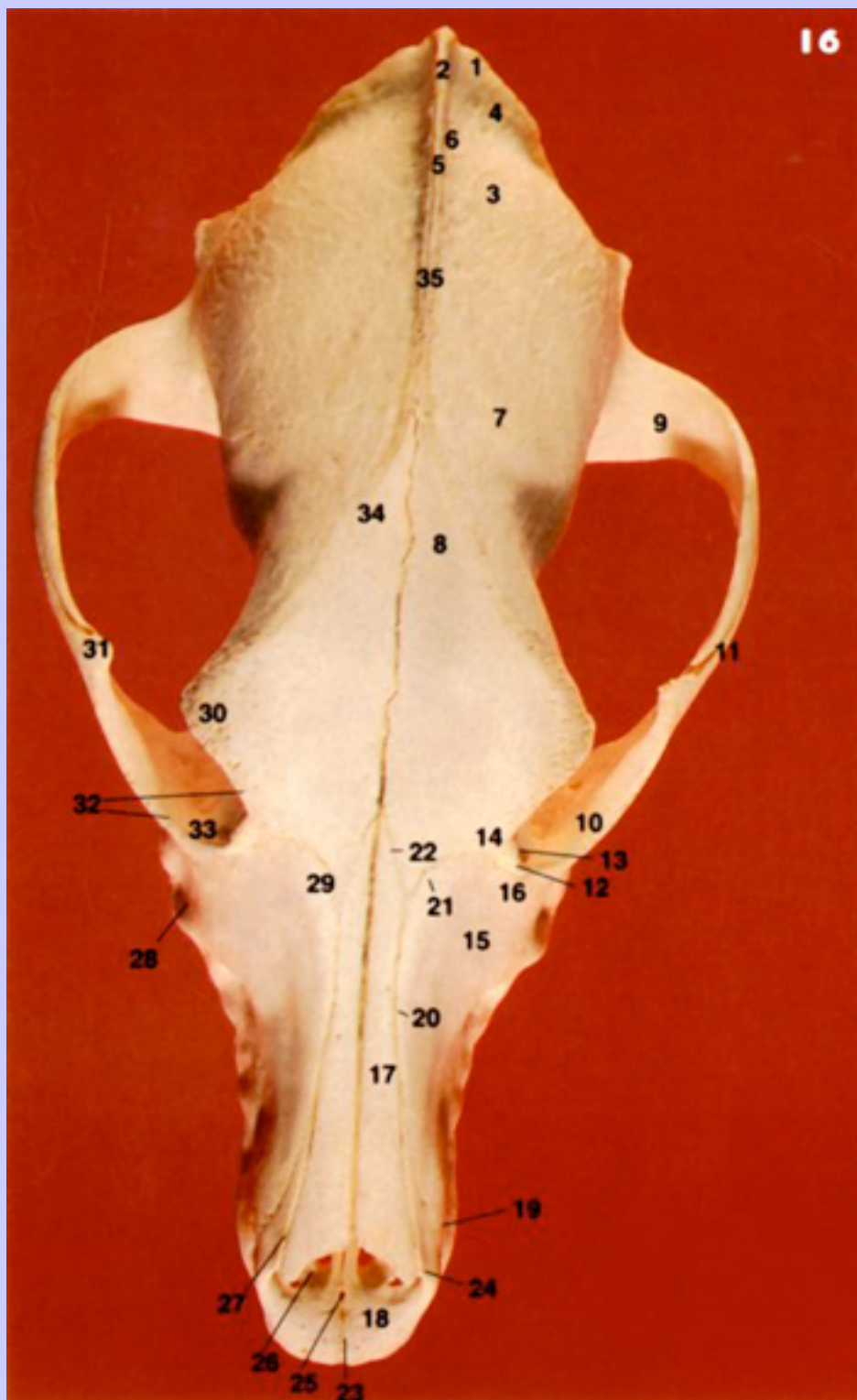
- 27 External occipital protuberance
- 28 Tentorium cerebelli osseum
- 29 Transverse canal
- 30 Petrous temporal bone
- 31 Tympanic bulla
- 32 External acoustic meatus
- 33 Condylod fossa
- 34 Occipital condyle
- 35 Jugular process
- 36 Presphenoid bone
- 37 Pterygoid process
- 38 Basihyoid bone
- 39 Thyrohyoid bone
- 40 Keratohyoid bone
- 41 Epihyoid bone
- 42 Stylohyoid bone
- 43 Tympanohyoid cartilage
- 44 Transverse process of first cervical vertebra (atlas)
- 45 Dorsal arch
- 46 Ventral arch
- 47 Intervertebral foramen
- 48 Transverse foramen
- 49 Body {of second cervical vertebra (axis)
- 50 Dens (odontoid process)
- 51 Spinous process
- 52 Cranial vertebral notch
- 53 Root of tongue

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- 54 Soft palate
- 55 Epiglottis
- 56 Thyroid cartilage
- 57 Cricoid cartilage
- 58 Trachea
- 59 Oesophagus
- 60 Third cervical vertebra

20

16 Dorsal aspect of the skull of a dog.

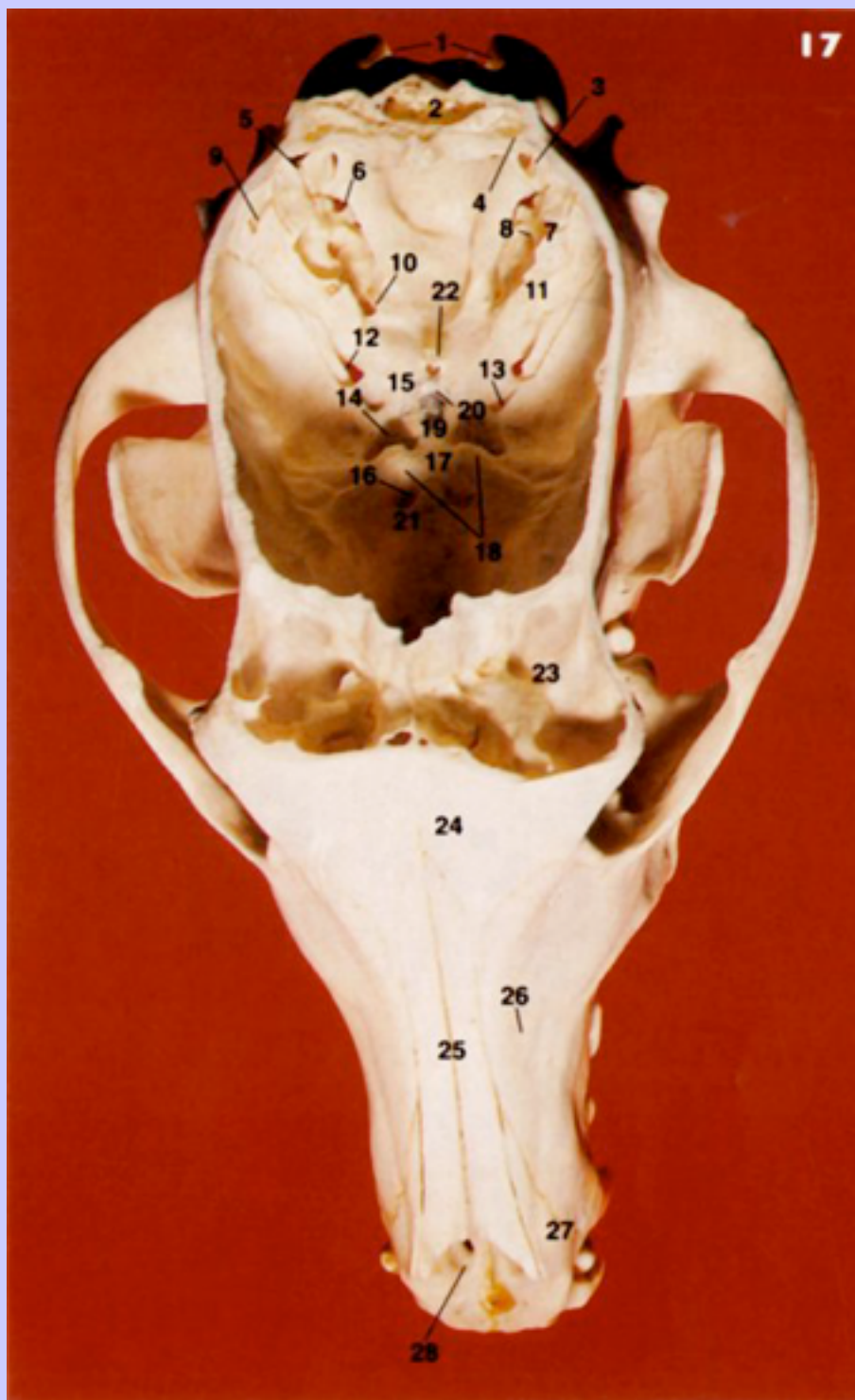


- 1 Occipital bone
- 2 Interparietal bone
- 3 Parietal bone
- 4 Occipitoparietal suture
- 5 Sagittal suture
- 6 Parietointerparietal suture
- 7 Parietofrontal or coronal suture
- 8 Frontal bone
- 9 Squamous part of temporal bone
- 10 Zygomatic bone
- 11 Temporozygomatic bone
- 12 Lacrimal bone
- 13 Lacrimozygomatic suture
- 14 Frontolacrima suture
- 15 Maxilla
- 16 Lacrimomaxillary suture
- 17 Nasal bone
- 18 Incisive bone
- 19 Incisivomaxillary suture
- 20 Nasomaxillary suture
- 21 Frontomaxillary suture
- 22 Frontonasal suture
- 23 Interincisive suture
- 24 Nasoincisive suture
- 25 Incisive canal
- 26 Palatine fissure

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- 27 Nasal process of 18
- 28 Infraorbital foramen
- 29 Frontal process of 15
- 30 Zygomatic process of 8 (supraorbital process)
- 31 Frontal process of 10
- 32 Orbital margin
- 33 Fossa for lacrimal sac
- 34 Temporal line
- 35 External sagittal crest

17 Dorsal aspect of the skull of a dog, with the dorsal calvaria removed. The angulation reveals the caudal structures of the cranial vault.



- 1 Occipital bone
- 2 Transverse canal
- 3 Condylloid canal
- 4 Hypoglossal canal
- 5 Mastoid foramen
- 6 Jugular foramen
- 7 Cerebellar fossa
- 8 Internal acoustic meatus
- 9 Canal for transverse sinus
- 10 Canal for trigeminal nerve
- 11 Crista partis petrosae
- 12 Foramen ovale
- 13 Foramen rotundum
- 14 Orbital fissure
- 15 Presphenoid bone
- 16 Optic canal
- 17 Sulcus chiasmatis
- 18 Rostral clinoid process
- 19 Hypophyseal fossa
- 20 Caudal clinoid process
- 21 Basisphenoid bone
- 22 Dorsum sellae
- 23 Frontal sinus (lateral part)
- 24 Frontal bone
- 25 Nasal bone
- 26 Maxilla

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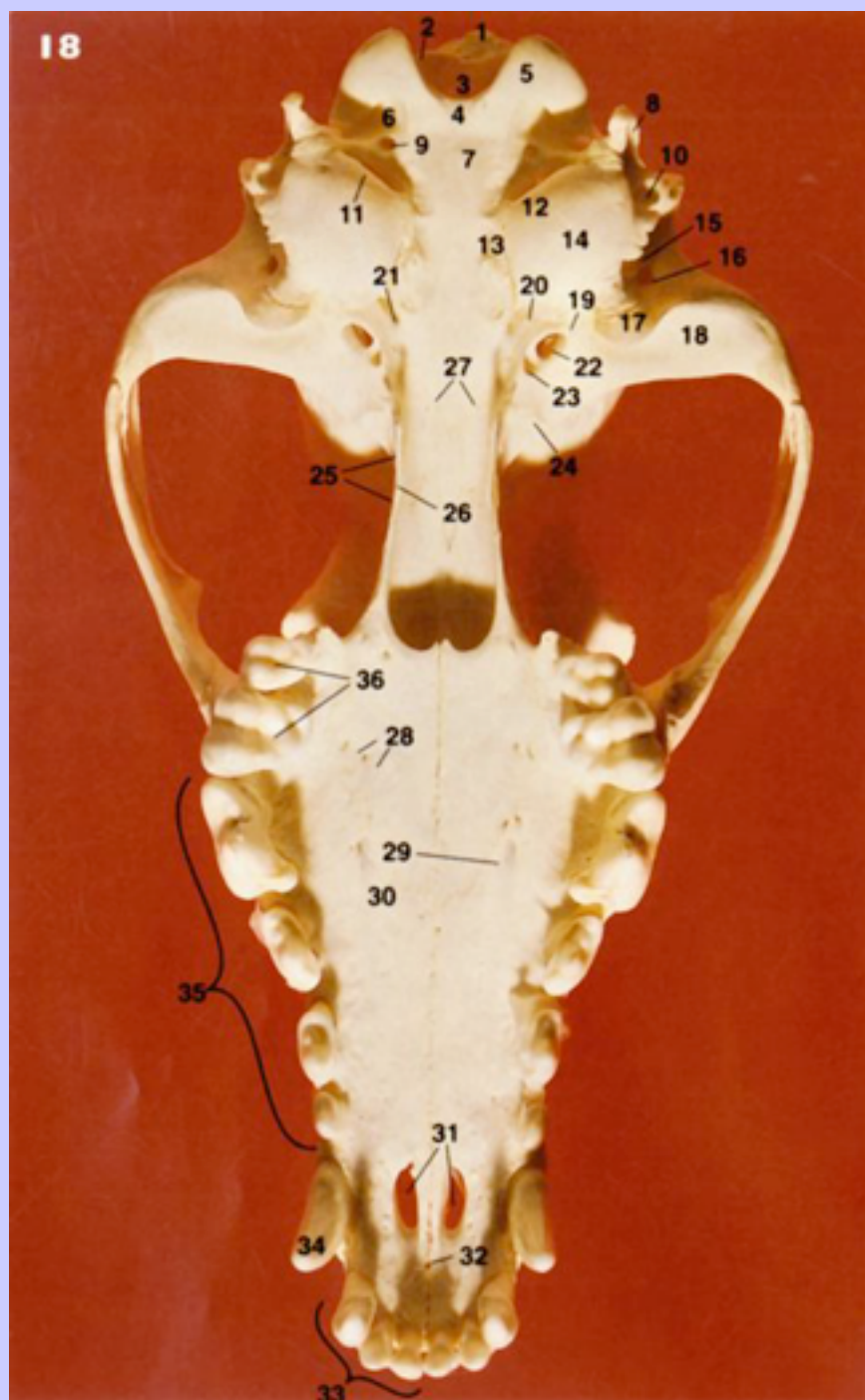
27 Incisive bone

28 Palatine fissure

21

22

18 Ventral aspect of the skull of a dog, showing the upper dental arches.



- 1 External occipital protuberance
- 2 Nuchal tubercle
- 3 Foramen magnum
- 4 Intercondyloid incisure
- 5 Condylod process
- 6 Ventral condylod fossa
- 7 Pharyngeal tubercle
- 8 Jugular process
- 9 Hypoglossal canal
- 10 Stylomastoid foramen
- 11 Tympano-occipital fissure
- 12 Jugular foramen
- 13 Muscular tubercle
- 14 Tympanic bulla
- 15 External acoustic meatus
- 16 Temporal meatus
- 17 Retroarticular process
- 18 Mandibular fossa
- 19 Petrotympanic fissure
- 20 Foramen lacerum
- 21 Musculotubal canal
- 22 Foramen ovale with spinous foramen
- 23 Caudal alar foramen
- 24 Rostral alar foramen
- 25 Orbital fissure
- 26 Optic canal

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27 Caudal foramen of pterygoid canal

28 Minor palatine foramen

29 Major palatine foramen

30 Palatine sulcus

31 Palatine fissure

32 Incisive canal

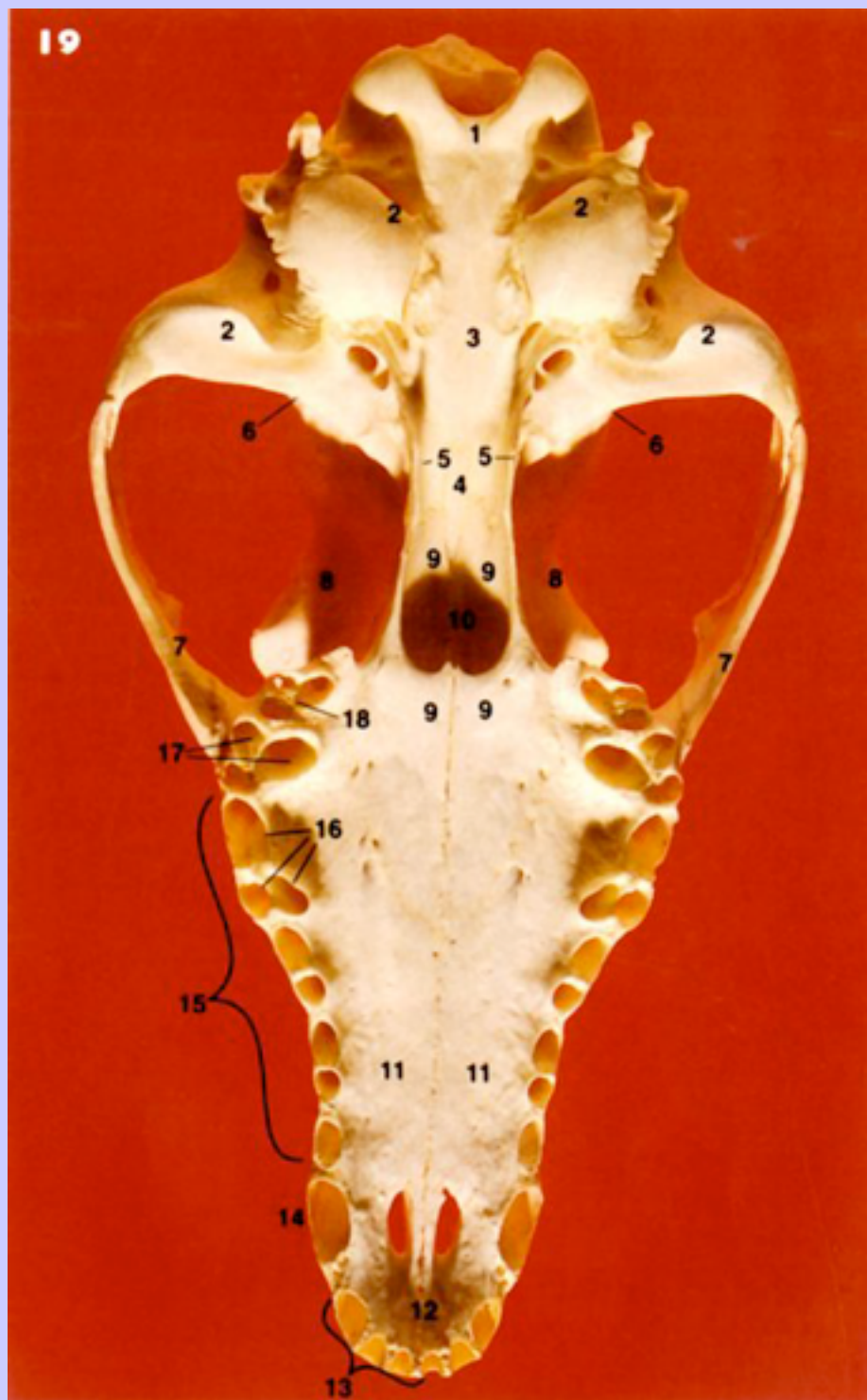
33 Incisor teeth

34 Canine tooth

35 Premolar teeth

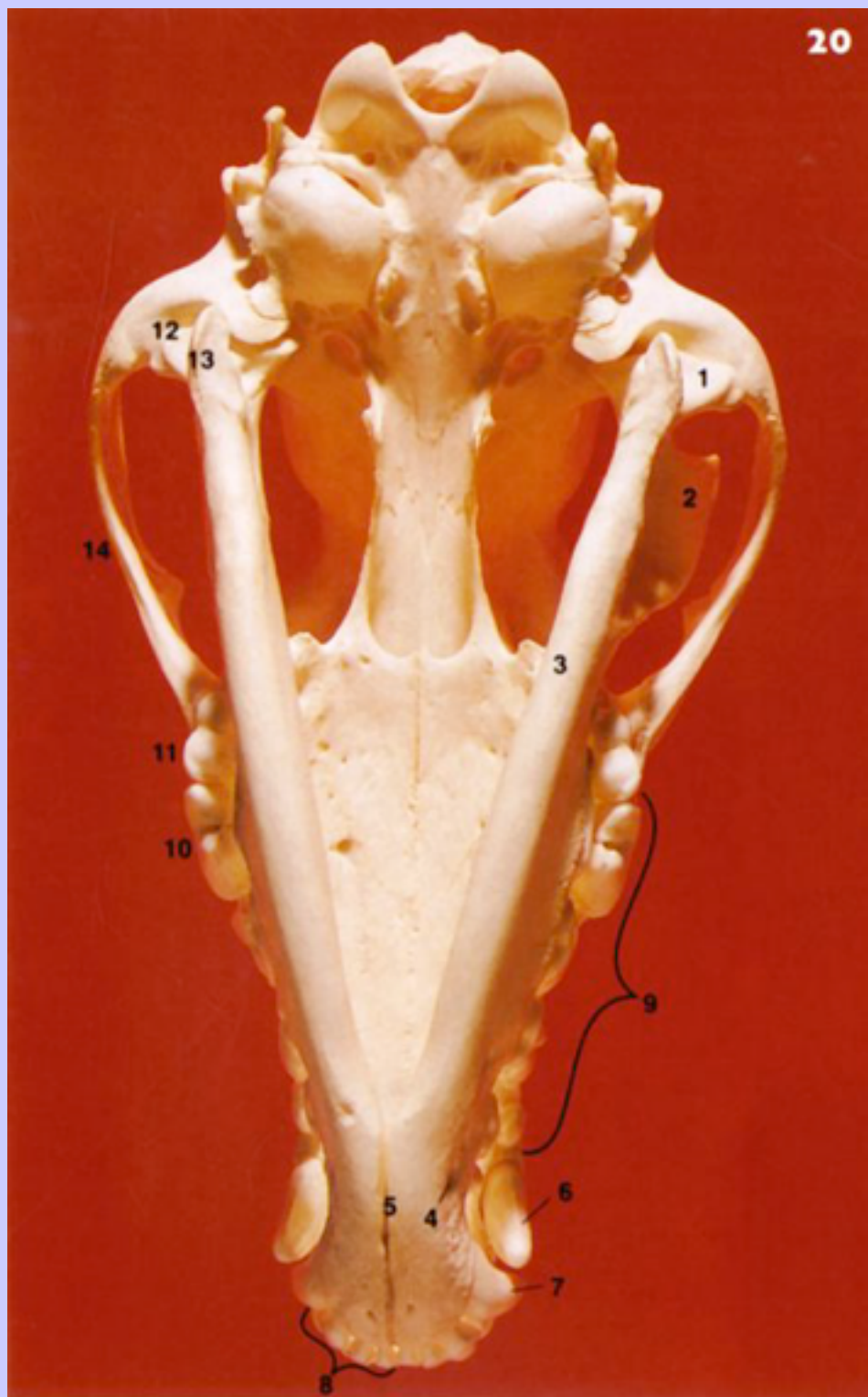
36 Molar teeth

19 Ventral aspect of the skull of a dog. The upper teeth have been removed to reveal the alveolar pattern of the upper dental arch.



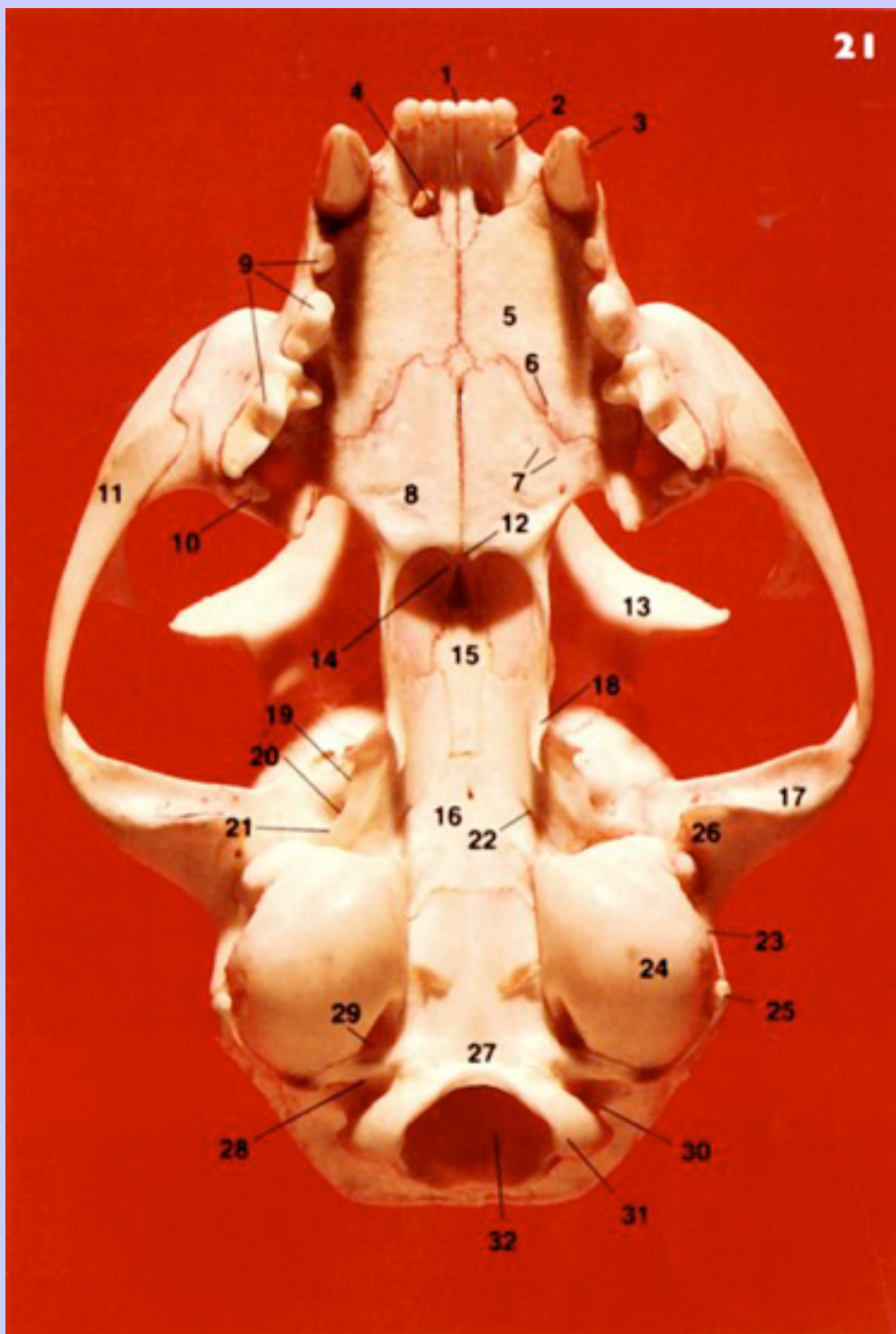
- 1 Occipital bone
- 2 Temporal bone
- 3 Basisphenoid bone
- 4 Presphenoid bone
- 5 Pterygoid bone
- 6 Parietal bone
- 7 Zygomatic bone
- 8 Frontal bone
- 9 Palatine bone
- 10 Vomer
- 11 Maxilla
- 12 Incisive bone
- 13 Alveoli of incisor teeth
- 14 Alveolus of canine tooth
- 15 Alveoli of premolar teeth
- 16 Alveolus of fourth premolar tooth
- 17 Alveolus of first molar tooth
- 18 Alveolus of second molar tooth

20 Ventral aspect of the skull and mandible of a dog.



- 1 Condylod process
- 2 Coronoid process
- 3 Body of mandible
- 4 Mental foramina
- 5 Mandibular symphysis
- 6 Upper canine tooth
- 7 Lower canine tooth
- 8 Lower incisor tooth
- 9 Upper premolar teeth
- 10 Fourth upper premolar tooth
- 11 First upper molar tooth
- 12 Temporomandibular joint
- 13 Angular process
- 14 Zygomatic arch

21 Ventral aspect of the skull of a cat. A marker dye has been used to highlight the suture lines.



- 1 Incisor teeth
- 2 Incisive bone
- 3 Canine tooth
- 4 Palatine fissure
- 5 Maxilla
- 6 Major palatine foramen
- 7 Minor palatine foramina
- 8 Palatine bone
- 9 Premolar teeth
- 10 Molar tooth
- 11 Zygomatic bone
- 12 Caudal nasal spine of 8
- 13 Frontal bone
- 14 Vomer
- 15 Presphenoid bone
- 16 Basisphenoid bone
- 17 Mandibular fossa
- 18 Hamulus of pterygoid
- 19 Rostral alar foramen
- 20 Caudal alar foramen
- 21 Foramen ovale
- 22 Pterygoid canal
- 23 External acoustic meatus
- 24 Tympanic bulla
- 25 Stylomastoid foramen
- 26 Retroarticular process

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- 27 Occipital bone
- 28 Jugular process
- 29 Jugular foramen
- 30 Ventral condyloid fossa
- 31 Occipital condyle (condyloid process)
- 32 Foramen magnum

23

22 Dorsal aspect of the mandible of a dog.

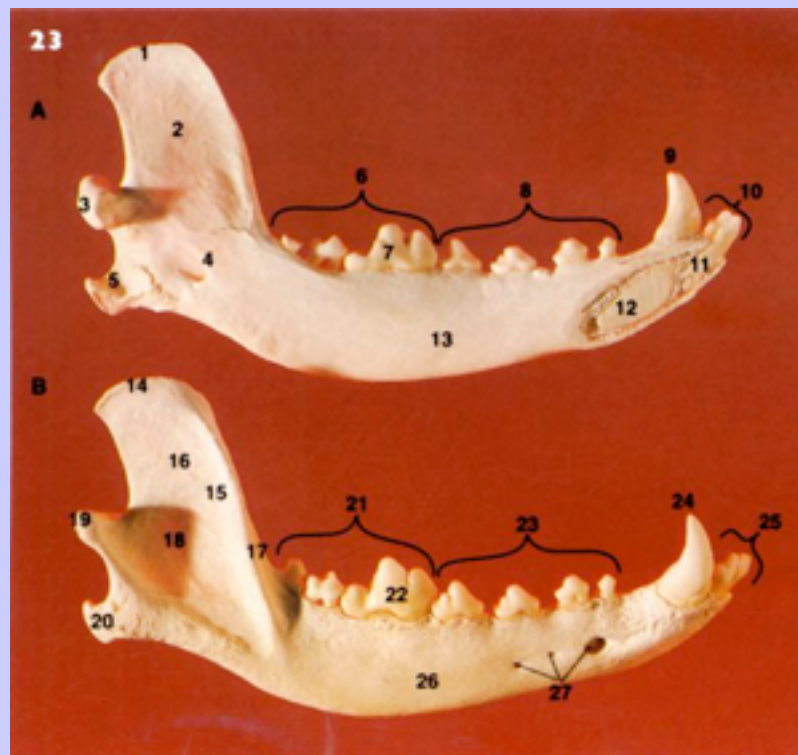
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- 1 Condylod process
- 2 Coronoid process
- 3 Coronoid crest
- 4 Mandibular foramen
- 5 Ramus of mandible
- 6 Lower molar teeth
- 7 Lower premolar teeth
- 8 Lower canine tooth
- 9 Lower incisor teeth
- 10 Mandibular symphysis
- 11 Body of mandible
- 12 Mylohyoid crest

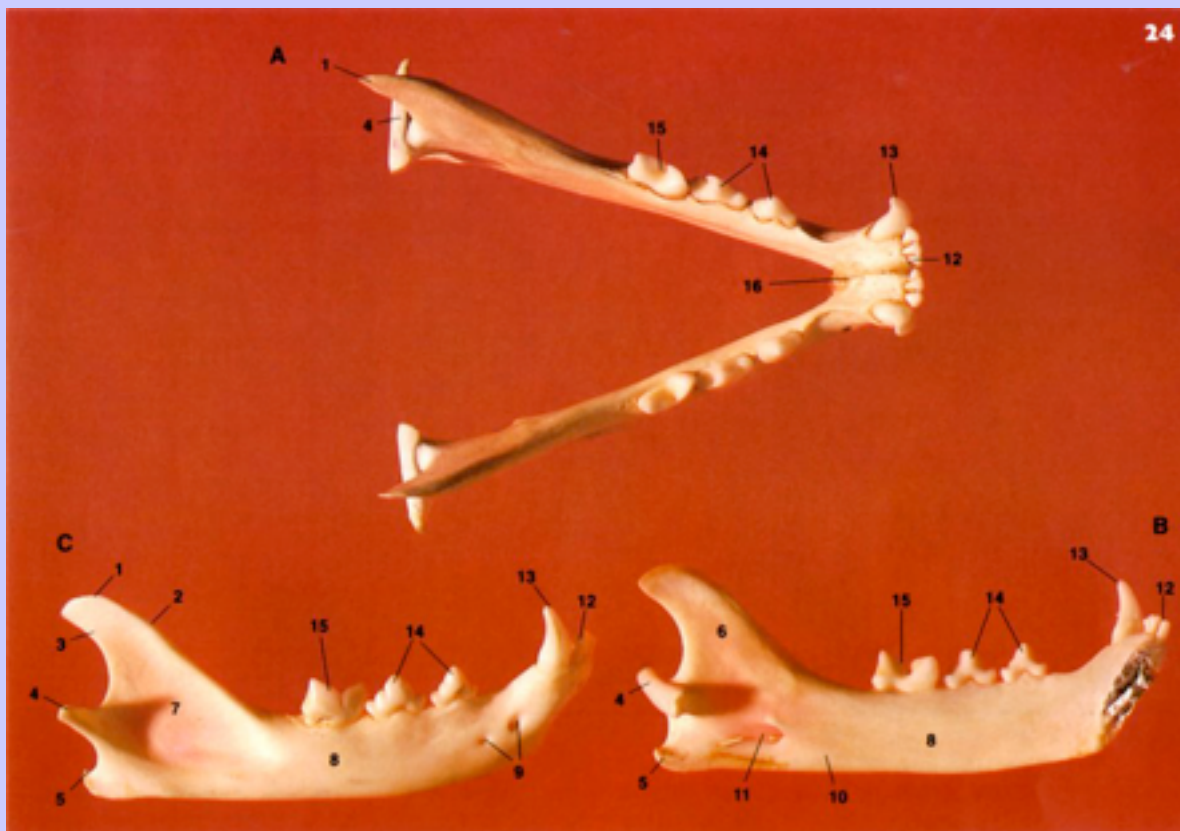
23 Medial (A) and lateral (B) aspect of the mandible of a dog.



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- 1 Coronoid process
- 2 Ramus of mandible
- 3 Condylod process
- 4 Mandibular foramen
- 5 Angular process
- 6 Molar teeth
- 7 First molar tooth
- 8 Premolar teeth
- 9 Canine tooth
- 10 Incisor teeth
- 11 Alveolus of incisor tooth
- 12 Canine root in alveolus
- 13 Body of mandible
- 14 Coronoid process
- 15 Coronoid crest
- 16 Ramus
- 17 Mandibular notch
- 18 Masseteric fossa
- 19 Condylod process
- 20 Angular process
- 21 Molar teeth
- 22 First molar tooth
- 23 Premolar teeth
- 24 Canine tooth
- 25 Incisor teeth
- 26 Body of mandible

24 Dorsal aspect (A) of the left and right mandibles, medial aspect (B) of the left mandible and lateral aspect (C) of the right mandible of a cat.



- 1 Coronoid process
- 2 Coronoid crest
- 3 Mandibular notch
- 4 Condylod process
- 5 Angular process
- 6 Ramus of mandible
- 7 Masseteric fossa
- 8 Body of mandible

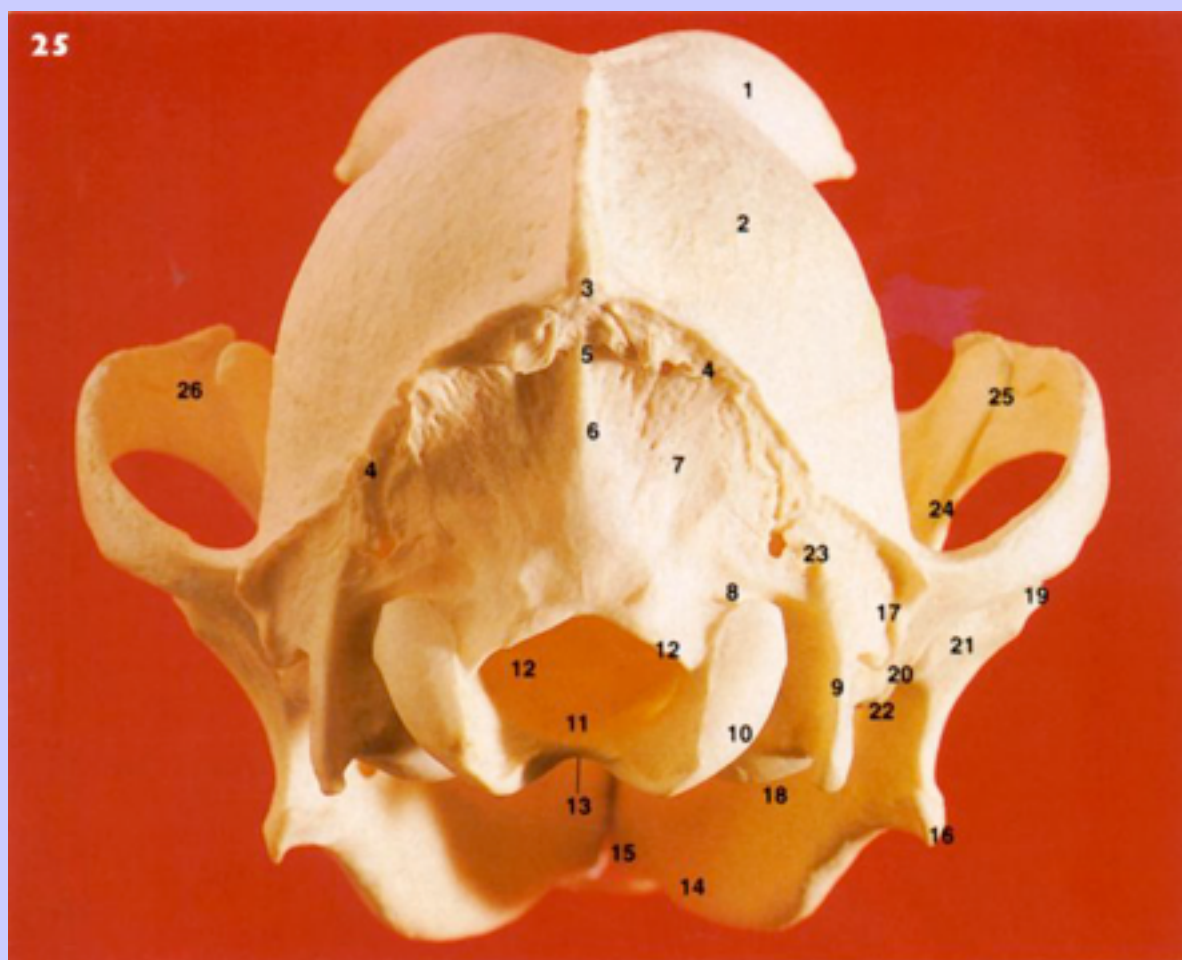
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- 9 Mental foramina
- 10 Mylohyoid crest
- 11 Mandibular foramen
- 12 Incisor teeth
- 13 Canine tooth
- 14 Premolar teeth
- 15 Molar tooth
- 16 Mandibular symphysis

25

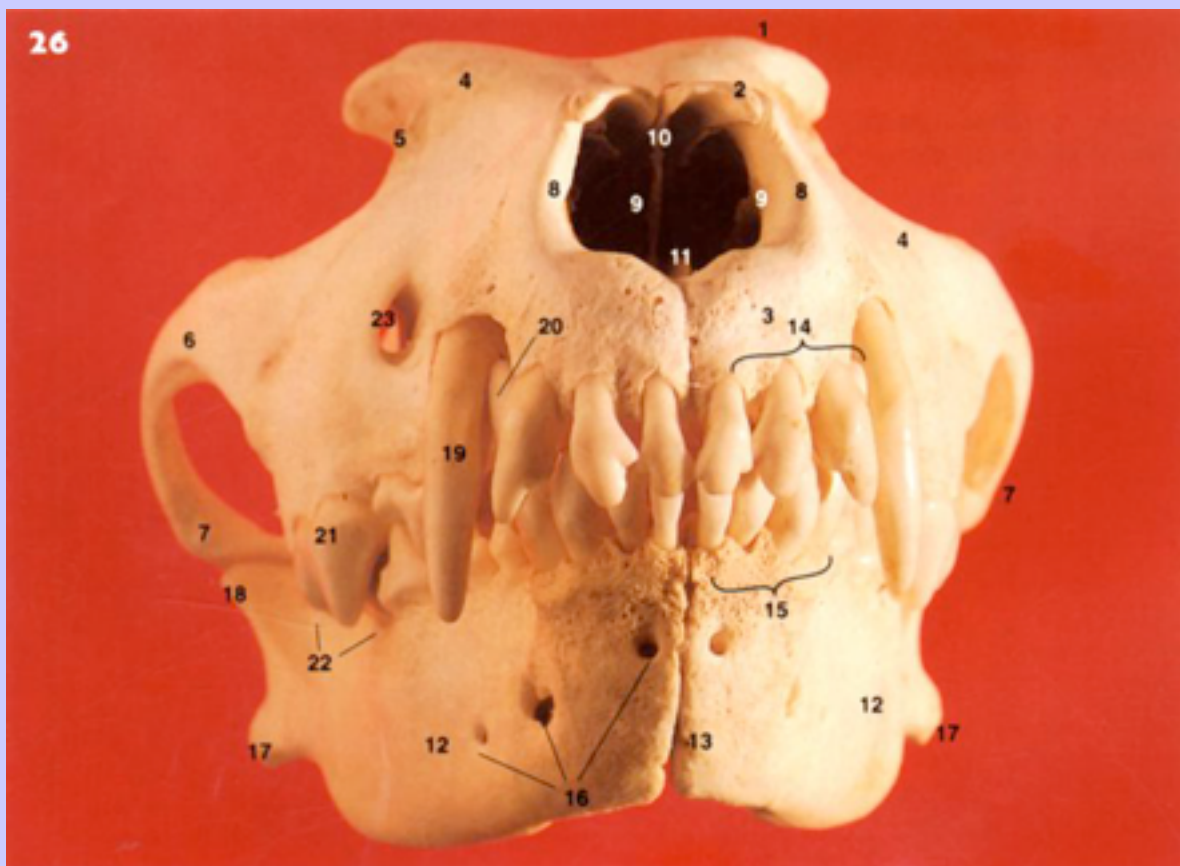
26

25 Caudal aspect of the skull and mandible of a dog.



- 1 Frontal bone
- 2 Parietal bone
- 3 Interparietal bone
- 4 Nuchal crest
- 5 External occipital protuberance
- 6 External occipital crest
- 7 Supraoccipital bone
- 8 Exoccipital bone
- 9 Jugular process
- 10 Occipital condyle
- 11 Foramen magnum
- 12 Nuchal tubercle
- 13 Intercondyloid notch
- 14 Body of mandible
- 15 Mandibular symphysis
- 16 Angular process
- 17 Temporal bone
- 18 Tympanic bulla
- 19 Zygomatic process
- 20 Mastoid process
- 21 Temporomandibular joint
- 22 Area of attachment of tympanohyoid
- 23 Mastoid foramen
- 24 Ramus of mandible
- 25 Coronoid process
- 26 Zygomatic bone

26 Rostral aspect of the skull and mandible of a dog.



- 1 Frontal bone
- 2 Nasal bone
- 3 Incisive bone
- 4 Maxilla
- 5 Lacrimal bone
- 6 Zygomatic bone
- 7 Zygomatic process of temporal bone
- 8 Osseous nasal opening
- 9 Nasal fossae
- 10 Nasal septum

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- 11 Vomer
- 12 Body of mandible
- 13 Mandibular symphysis
- 14 Upper incisor teeth
- 15 Lower incisor teeth
- 16 Mental foramina
- 17 Angular process
- 18 Temporomandibular joint
- 19 Upper canine tooth
- 20 Lower canine tooth
- 21 Fourth upper premolar tooth
- 22 First lower molar tooth
- 23 Infraorbital foramen

26

27 Frontomandibular radiograph of the head of a dog.

27



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- 1 Spinous process of second cervical vertebra (axis)
- 2 Dens (odontoid process)
- 3 Cranial articular surface
- 4 Transverse process of first cervical vertebral (atlas)
- 5 Alar notch
- 6 Transverse foramen
- 7 Caudal articular surface
- 8 Cranial articular surface
- 9 Nuchal line
- 10 Nuchal tubercle
- 11 Occipital condyle
- 12 Foramen magnum
- 13 Jugular process
- 14 Mastoid process
- 15 Petrous temporal bone
- 16 Crista partis petrosae
- 17 Tympanic bulla
- 18 External acoustic meatus
- 19 Hypophyseal fossa
- 20 Optic canal
- 21 Ethmoid fossa
- 22 Pterygoid process
- 23 Ethmoturbinates
- 24 Frontal sinus
- 25 Vomer
- 26 Palatine fissure

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- 27 Medial wall of orbit
- 28 Zygomatic arch
- 29 Frontal process of zygomatic bone
- 30 Condylod process
- 31 Angular process
- 32 Body of mandible
- 33 Coronoid process
- 34 Fourth upper premolar tooth
- 35 Upper canine tooth
- 36 Lower canine tooth

27

- 28 Lateral radiograph of the head of a brachycephalic breed of dog, demonstrating the greatly foreshortened facial portion of the skull.

28



- 29 Mandibulofrontal radiograph of the head of brachycephalic breed of dog, demonstrating the malocclusion of the upper and lower dental arches.



30 Dorsolateral aspect of the skull of a brachycephalic breed of dog, demonstrating the foreshortened facial region and the malocclusion of the dental arcade.



1 Frontal fossa

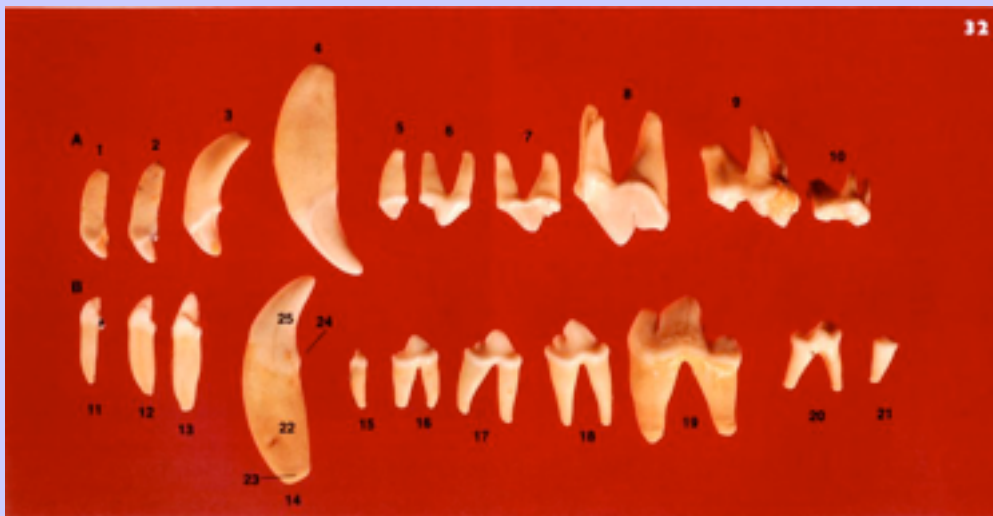
2 External nasal opening

28

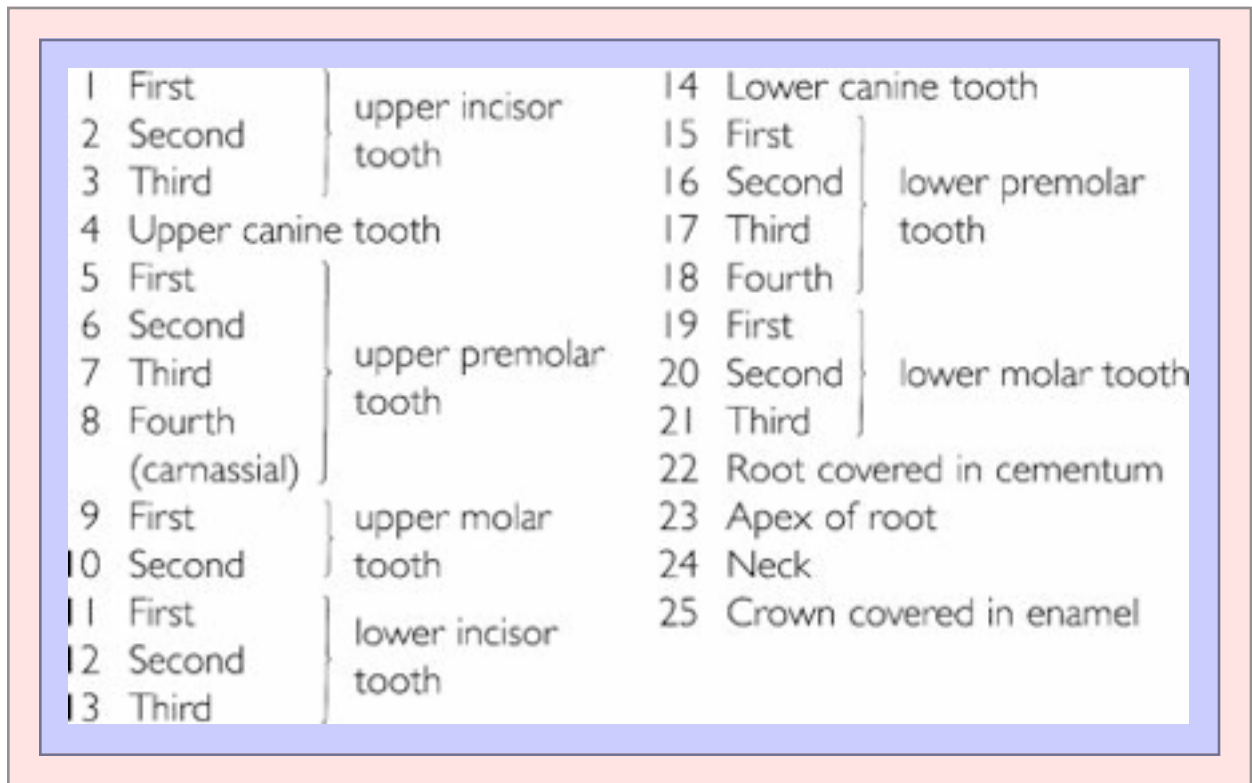
- 31 Lateral aspect of a dolichocephalic skull of a dog, demonstrating the elongation of the facial region. There is an increased space between the canine and first premolar tooth (diastema).



- 32 Dental arcade of an adult dog, showing the individual teeth from the upper (A) and lower (B) dental arch of the left half of a dog skull and mandible. Permanent dentition: $2 \left\{ I \frac{3}{3} C \frac{1}{1} P \frac{4}{4} M \frac{2}{3} \right\} = 42$. Deciduous dentition: $2 \left\{ Di \frac{3}{3} Dc \frac{1}{1} Dp \frac{3}{3} \right\} = 28$.



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2.0.1

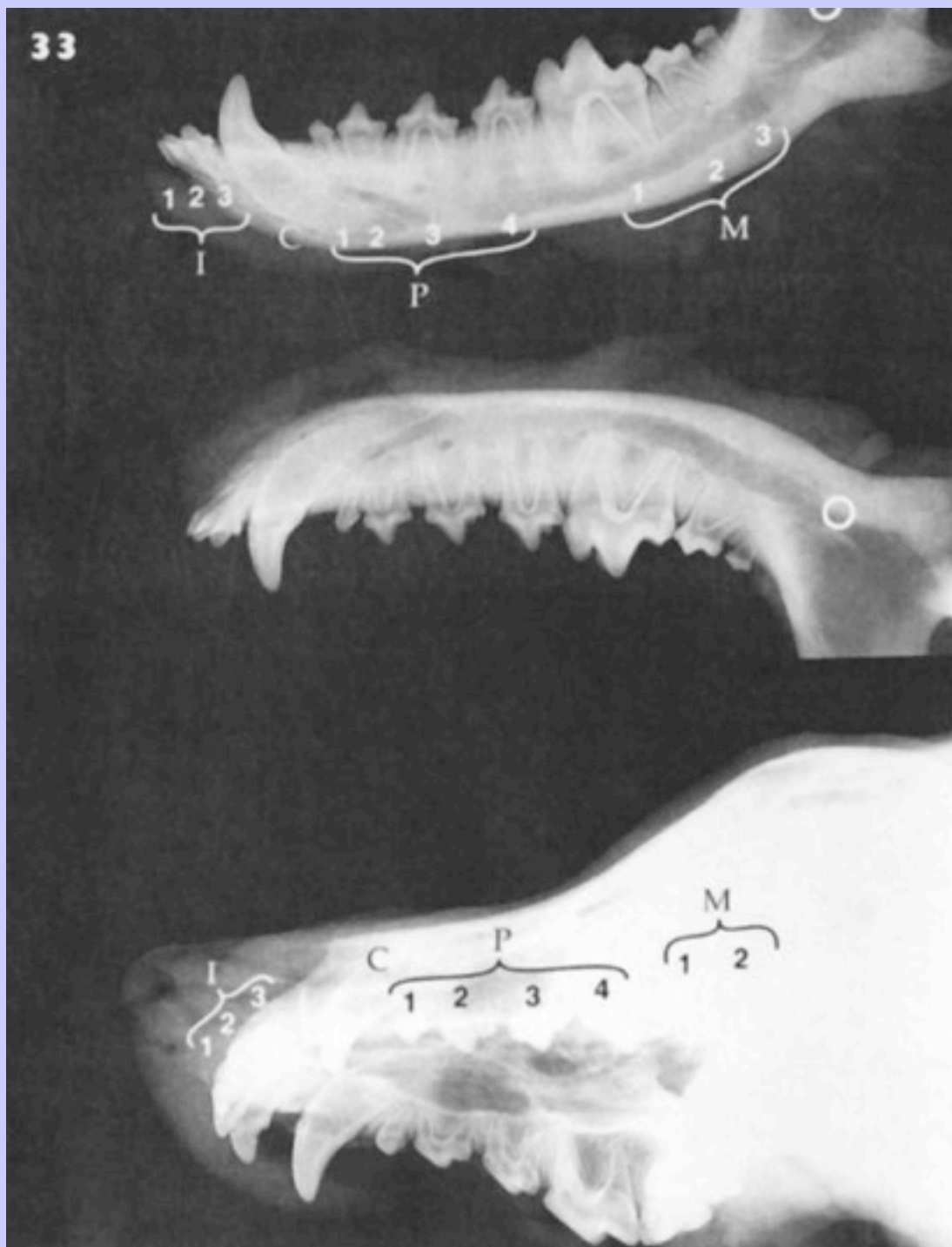
Clinical Note

4 Note the wide diameter of the root of the adult canine tooth. This diameter is greater than the periphery of the alveolus at the gum margin, making it dangerous to apply direct traction to remove the tooth. The alveolar margin may be enlarged using a dental elevator or the lateral wall of the alveolus may be broken down, permitting the tooth to be lifted from the alveolus.

8 & 19 The upper 4th premolar and lower 1st molar teeth are the carnassial or sectorial teeth. The food is moved to the cheek region and is suspended between these teeth, which have a scissor-like effect, facilitating the severing of larger portions of meat. The upper carnassial (**8**) has a trifid root system which presents problems in extraction. The widespread nature of the root system necessitates the use of a dental elevator to loosen the tooth within the alveolus before extraction is possible.

29

- 33 Radiograph of a disarticulated mandible with the two bodies separated, and an obliquely positioned skull, demonstrating the root formation of the adult canine dentition.



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C

Canine tooth

I

Incisor teeth

P/PM

Premolar teeth

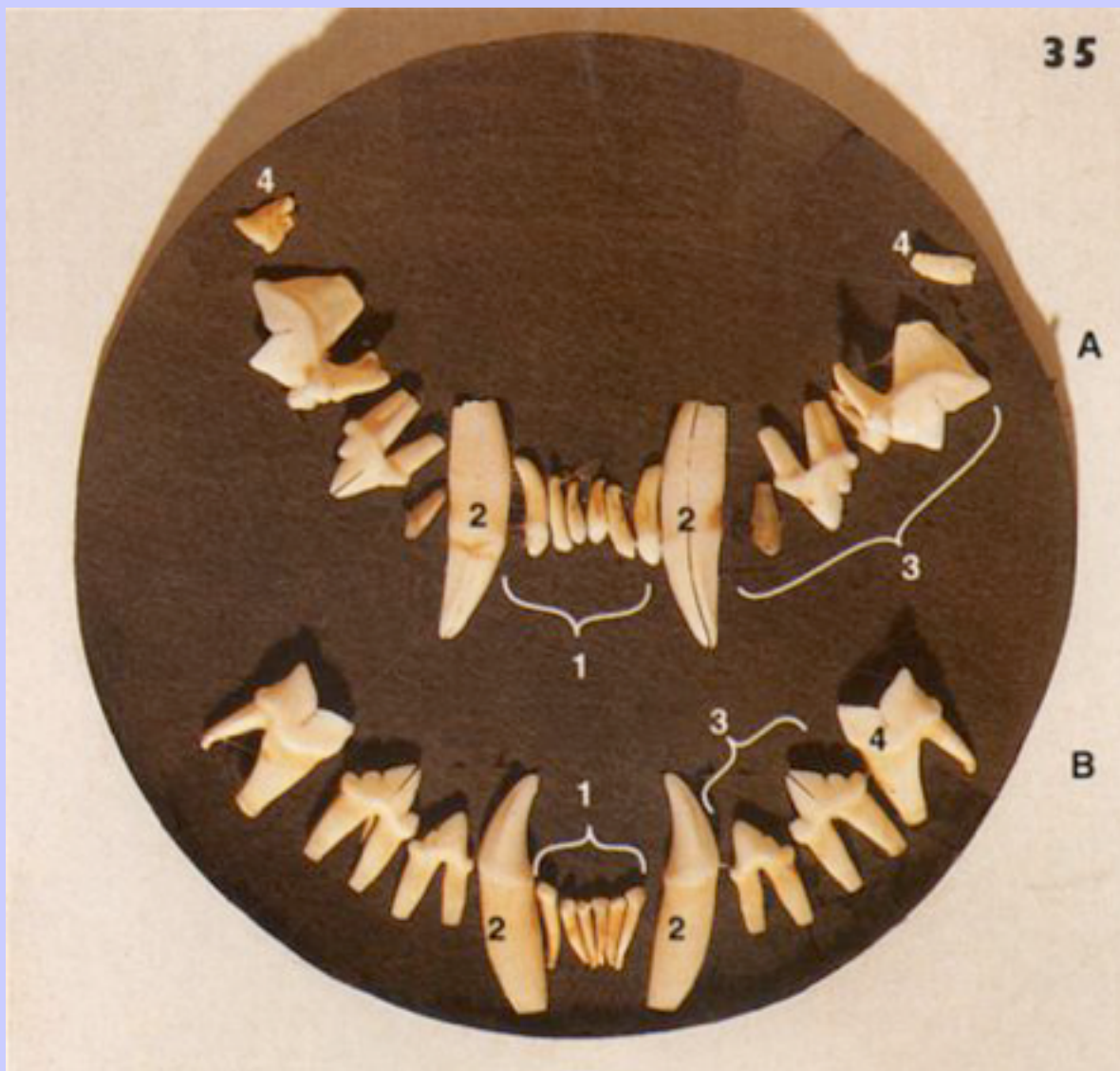
M

Molar teeth

- 34 Radiograph of the disarticulated and divided mandible and the obliquely positioned skull of a puppy, demonstrating the replacement of the deciduous dentition by the permanent dental arches. The deciduous incisors have been lost and the deciduous canines and premolars can be seen above their permanent replacements. Note that the first premolar occurs in the deciduous arch, but remains as a permanent tooth.



35 Dental arcade of an adult cat, showing the individual teeth from the upper (A) and lower (B) dental arch.



- 1 Incisor teeth
- 2 Canine tooth
- 3 Premolar teeth
- 4 Molar tooth

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2.0.2

Clinical Note

Permanent dentition:

$$2 \left\{ I \frac{3}{3} C \frac{1}{1} P \frac{3}{2} M \frac{1}{1} \right\} = 30$$

The third upper premolar and first lower molar are the sectorial teeth.

Deciduous dentition:

$$2 \left\{ Di \frac{3}{3} Dc \frac{1}{1} Dp \frac{3}{2} \right\} = 26$$

36 Lateral aspect of the head of a dog. Only the skin has been resected to reveal the superficial muscles.



- 1 M. platysma
- 2 M. sphincter colli superficialis
- 3 External jugular vein
- 4 M. parotidoauricularis
- 5 M. zygomaticoauricularis
- 6 Mm. cervicoauricularis
- 7 M. sphincter colli profundus
- 8 M. zygomaticus
- 9 M. orbicularis oris
- 10 M. levator nasolabialis
- 11 M. frontalis
- 12 M. orbicularis oculi
- 13 M. retractor anguli oculi lateralis
- 14 M. scutuloauricularis
- 15 Palpebral nerve (VII)
- 16 Zygomaticotemporal nerve (V)

31

37 Lateral aspect of the head of a dog after removal of the superficial muscles.

32



- 1 M. sternomastoideus
- 2 M. sterno-occipitalis
- 3 M. cleidocervicalis
- 4 External jugular vein
- 5 Mandibular salivary gland
- 6 Mandibular lymph node
- 7 M. digastricus
- 8 M. parotidoauricularis
- 9 Linguofacial vein
- 10 M. mylohyoideus
- 11 Maxillary vein
- 12 Parotid salivary gland
- 13 M. masseter
- 14 Parotid duct
- 15 Facial vein
- 16 M. buccinator
- 17 Lingual vein
- 18 M. orbicularis oris
- 19 M. levator nasolabialis
- 20 M. levator labii maxillaris
- 21 M. zygomaticus
- 22 M. frontalis
- 23 M. retractor anguli oculi lateralis
- 24 M. temporalis
- 25 Zygomatic arch
- 26 Zygomaticotemporal nerve (V)

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- 27 Palpebral nerve (VII)
- 28 Dorsal buccal branch (VII)
- 29 Ventral buccal branch (VII)
- 30 Auriculotemporal nerve (V)

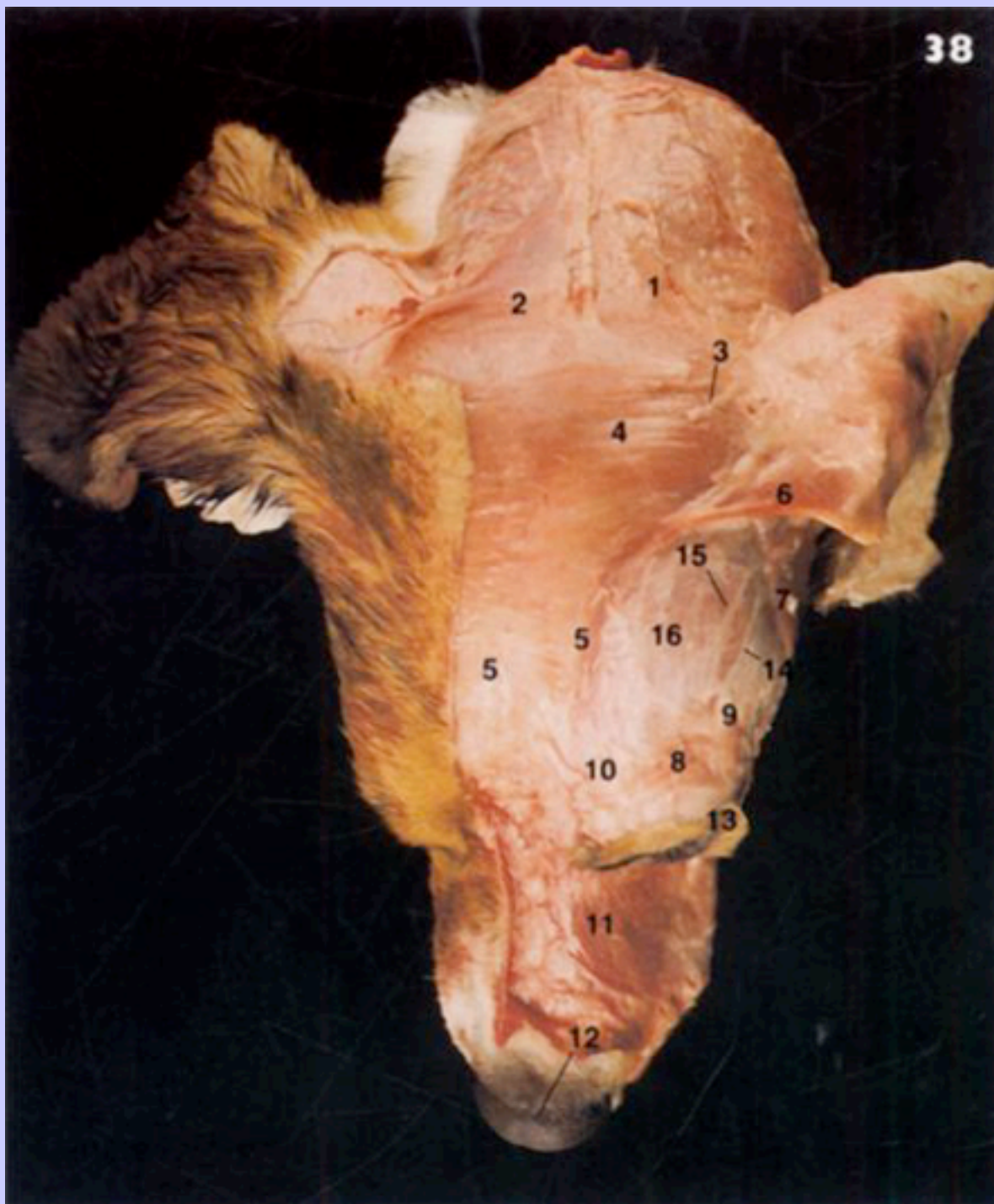
2.0.3

Clinical Note

- 5 This is labelled as the mandibular salivary gland but in reality the structure incorporates both the mandibular gland and the monostomatic portion of the sublingual salivary gland. The two glands have separate ducts which run alongside each other deep to the M. digastricus and the body of the mandible.
- 6 This lymph node is normally palpable in the live dog and is used routinely in clinical examinations. Note its relationship to the division of the linguofacial vein and do not confuse it with the larger mandibular salivary gland which lies more dorsal in position.
- 12 Note the position of this gland relative to the cartilaginous external ear canal. During surgery to resect the vertical portion of the ear canal the parotid salivary gland is vulnerable to damage due to its proximity to the canal.
- 14 Note the position and course of the parotid duct. By resecting its oral opening into the buccal cavity at the level of the 4th upper premolar tooth this duct can be transplanted from its situation on the lateral facial region to be inserted into the upper lateral angle of the eye in an attempt to overcome the lack of tear secretion in the condition keratoconjunctivitis sicca (KCS).

32

38 Dorsal aspect of the superficial muscles of the head of a dog.

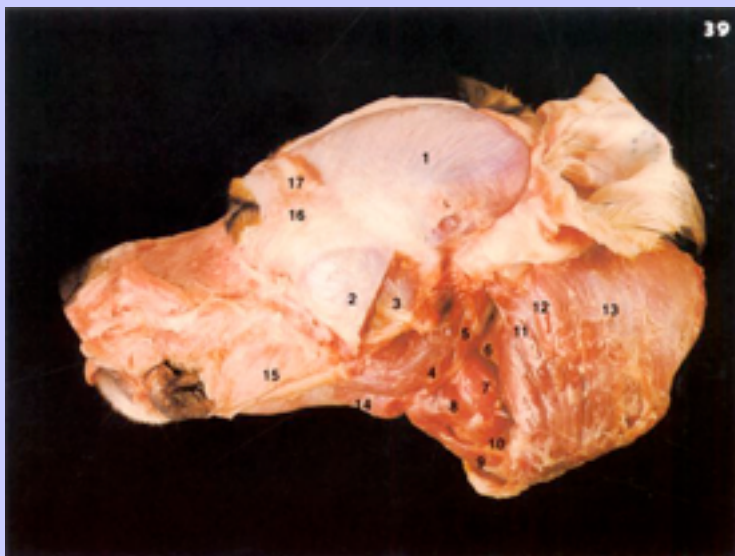


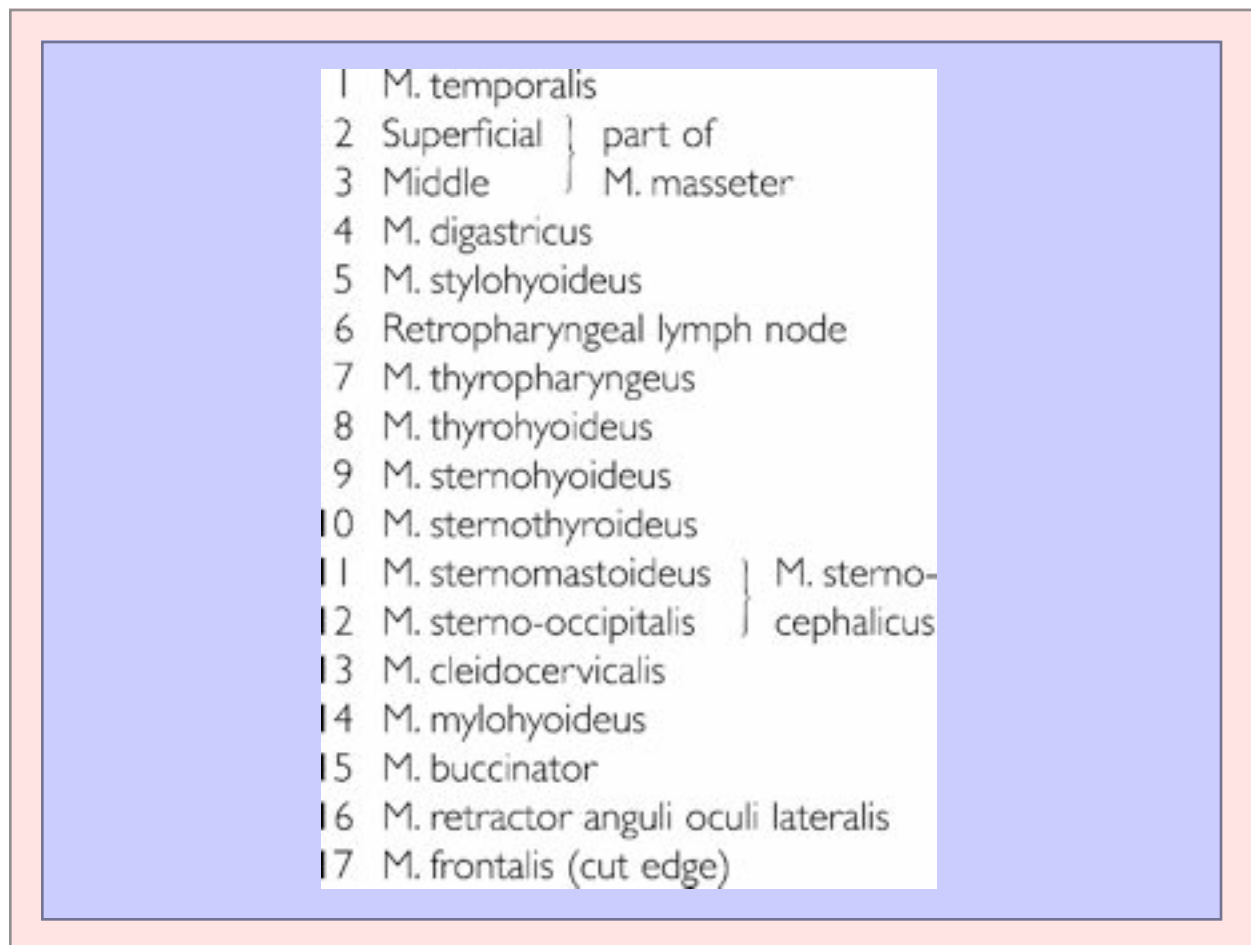
1 M. cervicocutularis

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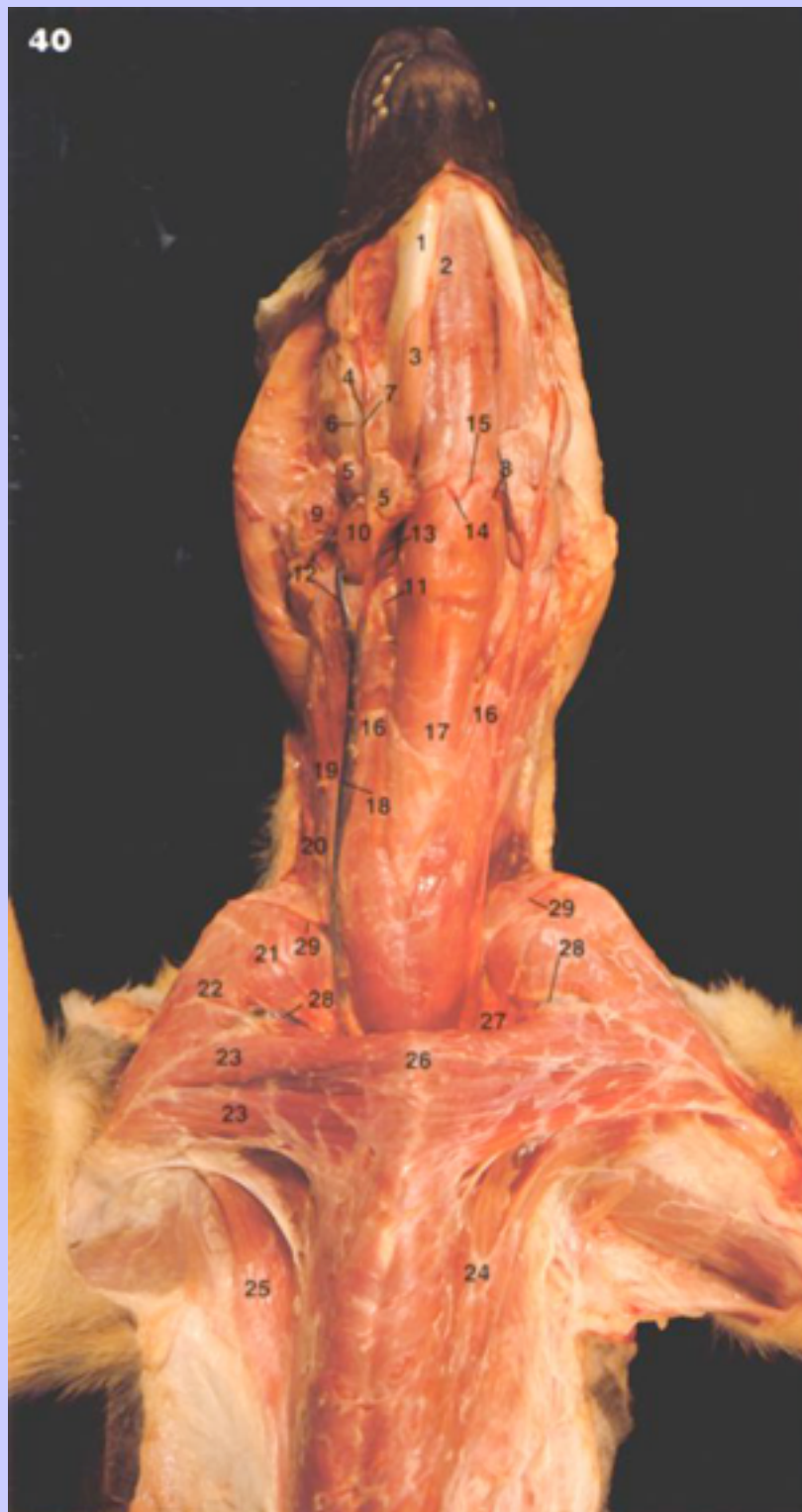
- 2 M. cervicoauricularis
- 3 Cutaneous branch of second cervical nerve
- 4 M. interscutularis
- 5 M. frontalis (cut edge)
- 6 M. scutuloauricularis (cut edge)
- 7 M. zygomaticus
- 8 M. orbicularis oculi
- 9 M. retractor anguli oculi lateralis
- 10 M. levator anguli oculi medialis
- 11 M. levator nasolabialis
- 12 Planum nasale
- 13 Palpebral rim
- 14 Palpebral nerve (VII)
- 15 Branches of rostral auricular nerve (VII)
- 16 M. temporalis

39 Lateral aspect of the muscles of the head of a dog after removal of the skin and cutaneous muscles.





40 Ventral aspect of the superficial muscles of the head and neck of a dog.



- 1 Body of mandible
- 2 M. mylohyoideus
- 3 M. digastricus
- 4 M. masseter
- 5 Mandibular lymph nodes
- 6 Parotid duct
- 7 Facial vein
- 8 M. stylohyoideus
- 9 Parotid gland
- 10 Mandibular salivary gland
- 11 Medial retropharyngeallymph node
- 12 Maxillary vein
- 13 Lingual vein
- 14 Hyoid venous arch
- 15 Submental vein
- 16 M. sternomastoideus and M. sterno-occipitalis (M. sternocephalicus)
- 17 M. stemohyoideus
- 18 External jugular vein
- 19 M. cleidomastoideus
- 20 M. cleidocervicalis
- 21 Clavicular tendon
- 22 M. cleidobrachialis (M. brachiocephalicus)
- 23 Mm. pectorales superficiales
- 24 M. pectoralis profundus
- 25 M. latissimus dorsi
- 26 Manubrium sterni

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27 Supraclavicular fossa

28 Cephalic vein

29 Omobrachial vein

2.0.4

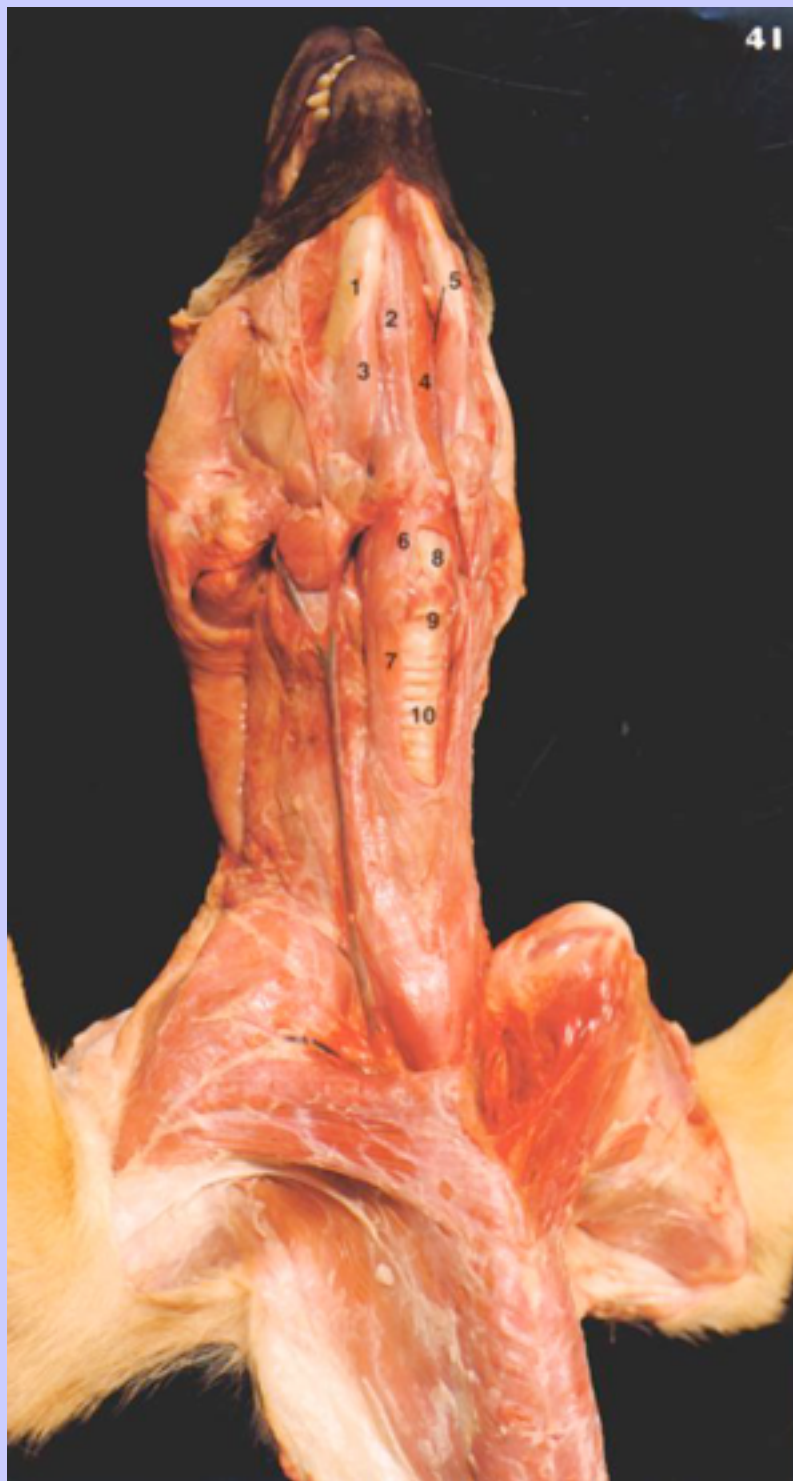
Clinical Note

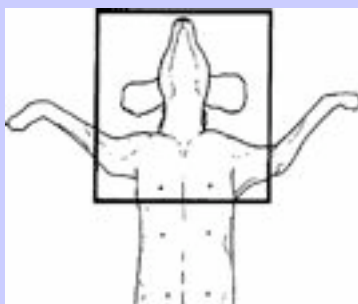
17 Note the presence of the midline fibrous raphe between the muscles of both sides. Surgical incisions in the cervical region are always made exactly midline ventrally through this raphe to minimise trauma to surrounding tissue and reduce haemorrhage. The muscles can then be spread laterally to reveal deeper structures.

18 The jugular vein, as it runs in this ventrolateral position, is accessible for venepuncture in the conscious dog, being a convenient site for the collection of larger volume blood samples. Blood is flowing towards the thorax and so pressure is placed on the vein at the more caudal ventral cervical region to raise the pressure and engorge the vein prior to insertion of the needle.

34

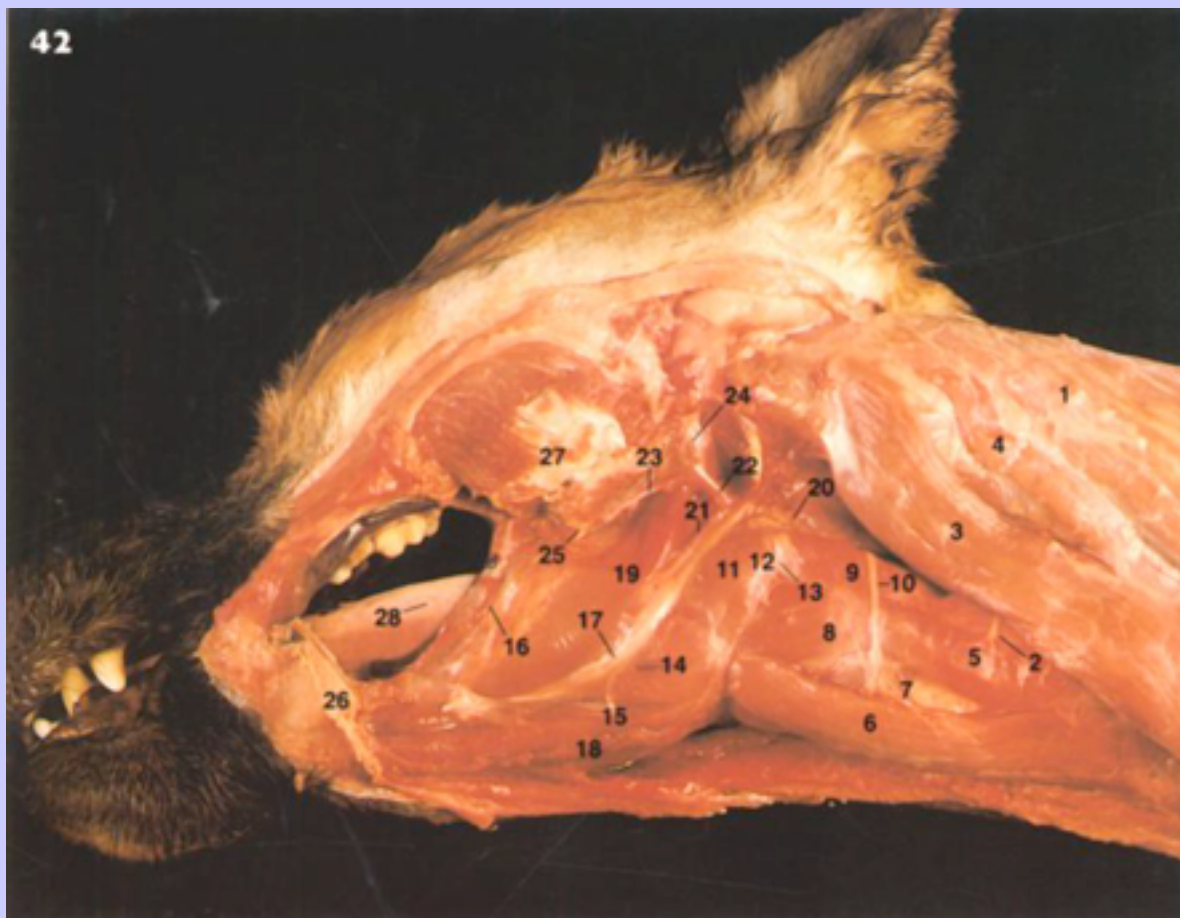
- 41 Ventral aspect of the head and neck of a dog. The sternohyoideus and sternothyroideus muscles have been resected to expose the trachea.






- 1 Body of mandible
- 2 M. mylohyoideus
- 3 M. digastricus
- 4 M. geniohyoideus
- 5 M. styloglossus
- 6 M. thyrohyoideus
- 7 M. sternothyroideus
- 8 Thyroid cartilage
- 9 Cricoid cartilage
- 10 Trachea

42 Ventrolateral aspect of the muscles of the head and neck of a dog. The left ramus and body of the mandible have been removed by sectioning off the muscles close to their insertions on these structures.



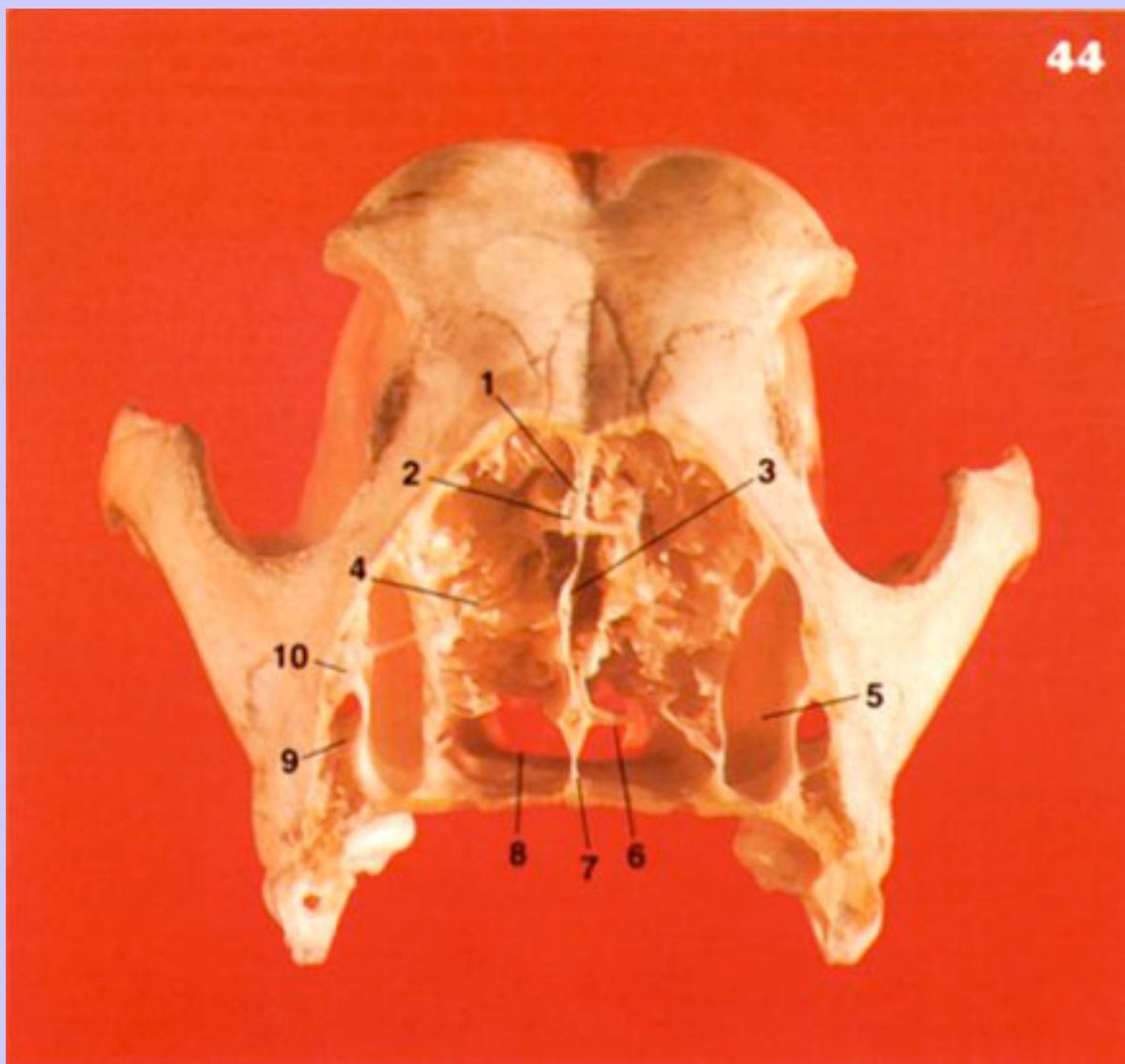
- 
- 1 M. cleidocervicalis
 - 2 Second cervical nerve
 - 3 M. sternomastoideus } M. sterno-
 - 4 M. sterno-occipitalis } cephalicus
 - 5 M. sternothyroideus
 - 6 M. sternohyoideus
 - 7 M. cricothyroideus
 - 8 M. thyrohyoideus
 - 9 M. thyropharyngeus
 - 10 Cervical nerve
 - 11 M. ceratopharyngeus
 - 12 M. chondropharyngeus
 - 13 Cranial laryngeal nerve
 - 14 M. hyoglossus
 - 15 M. geniohyoideus
 - 16 Buccal nerve
 - 17 Hypoglossal nerve
 - 18 M. mylohyoideus
 - 19 M. styloglossus
 - 20 Vagosympathetic trunk
 - 21 Lingual artery
 - 22 External carotid artery
 - 23 Facial artery
 - 24 Maxillary artery
 - 25 Lingual nerve (cut ends)
 - 26 Body of mandible (cut)
 - 27 M. masseter
 - 28 Tongue (foliate papillae)

43 Lateral radiograph of the head of a dog. Radio-opaque material has been injected into the ventral lacrimal punctum to demonstrate the course of the nasolacrimal duct.



- 1 Needle in ventral lacrimal punctum
- 2 Lacrimal sac
- 3 Nasolacrimal duct
- 4 Duct discharging into floor of nasal vestibule
- 5 Refluxed radio-opaque material in ventral meatus

44 Rostral aspect of a transverse section of the skull of a dog, at the level of the fourth upper premolar tooth.

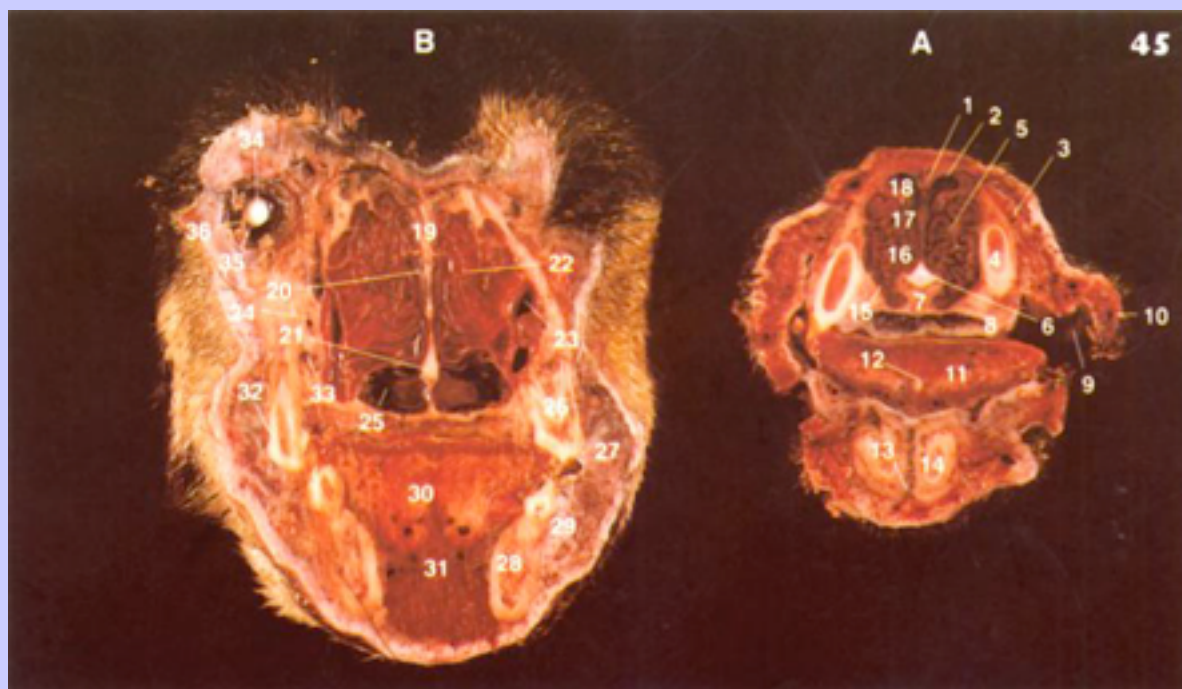


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- 1 Ethmoid bone
- 2 Labyrinth (conchae)
- 3 Perpendicular plate or lamina
- 4 Lateral lamina
- 5 Maxillary recess
- 6 Transverse lamina
- 7 Vomer
- 8 Choana leading to nasopharyngeal meatus
- 9 Infraorbital canal
- 10 Nasolacrimal canal

45 Transverse sections through the nasal cavity of a dog, at the level of (A) the upper canine tooth and (B) the fourth upper premolar tooth.



2.0.5

Clinical Note

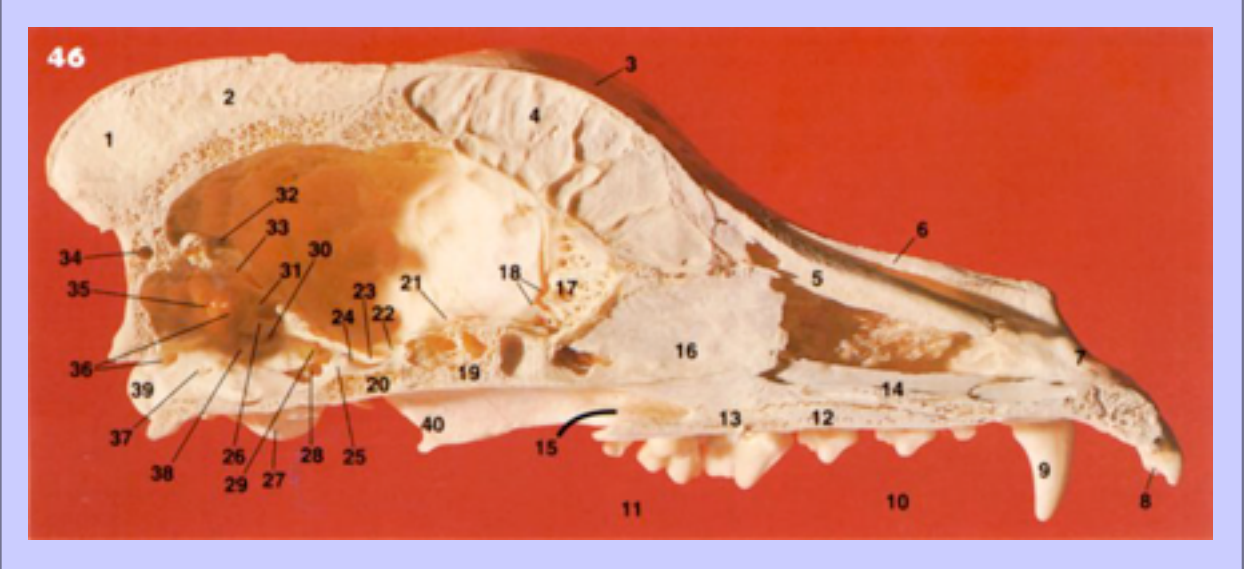
26 Note that the root of this tooth lies immediately ventral to the maxillary recess (**23**). Infection of the tooth root can erode into the recess. If left untreated this can cause swelling in the facial region ventral to the eye and eventually will fistulate through to the exterior, producing a purulent discharge.

- 1 Nasal bone
- 2 Dorsal nasal concha
- 3 Maxilla
- 4 Upper canine tooth
- 5 Ventral nasal concha
- 6 Cartilaginous nasal septum
- 7 Vomer
- 8 Hard palate

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- 9 Buccal cavity
- 10 Upper lip (labia superior)
- 11 Tongue
- 12 Lyssa
- 13 Body of mandible
- 14 Lower canine tooth
- 15 Ventral meatus
- 16 Common meatus
- 17 Middle meatus
- 18 Dorsal meatus
- 19 Septal process of frontal bones
- 20 Perpendicular plate, ethmoid bone
- 21 Vomer
- 22 Ethmoidal conchae
- 23 Maxillary recess
- 24 Nasolacrimal duct
- 25 Nasopharynx
- 26 Fourth premolar tooth
- 27 M. buccinator
- 28 Body of mandible
- 29 Lower premolar tooth
- 30 Tongue
- 31 M. geniohyoideus
- 32 Root canal of upper molar tooth
- 33 Infraorbital canal
- 34 Lens
- 35 Iris

46 Median section of the skull of a dog.



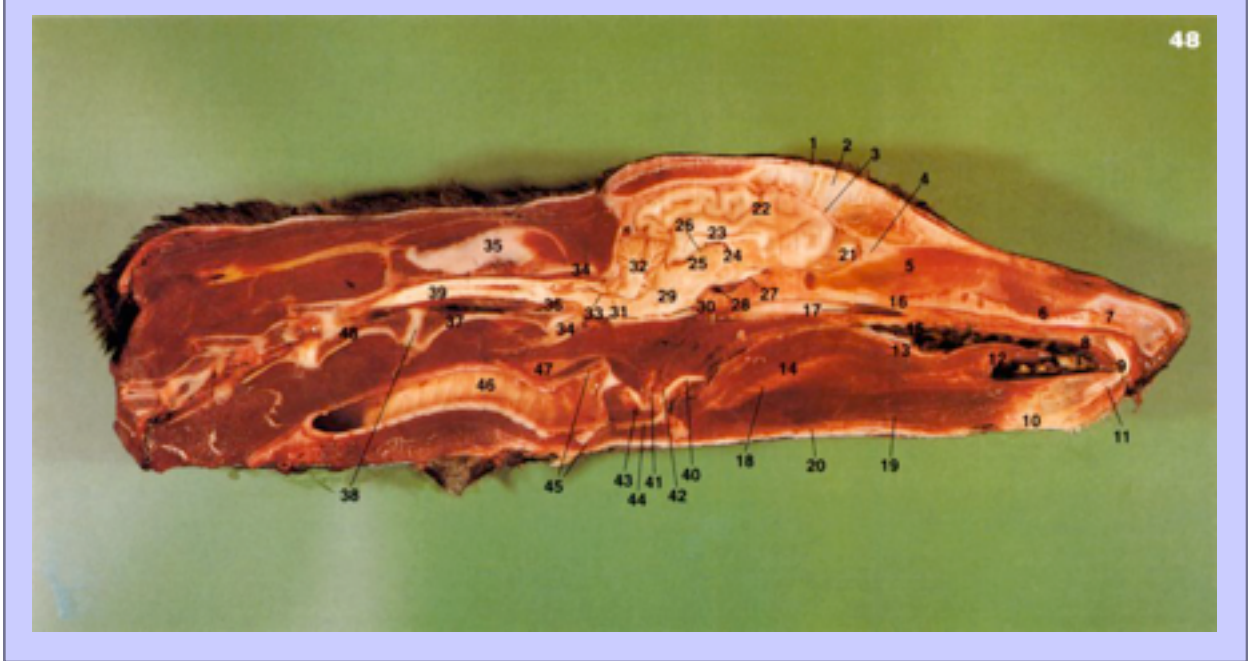
1 Interparietal bone	12 Palatine process of maxilla	20 Body of basisphenoid bone	30 Internal acoustic meatus
2 Parietal bone	13 Horizontal plate of palatine bone	21 Optical canal	31 Cerebellar fossa
3 Frontal bone	14 Vomer	22 Orbital fissure	32 Tentorium osseum
4 Median septum of frontal sinus	15 Nasopharyngeal meatus	23 Foramen rotundum viewed through rostral alar foramen	33 Transverse groove
5 Nasal bone	16 Osseous nasal septum of ethmoid bone	24 Foramen ovale	34 Transverse canal
6 Maxilla	17 Cribriform plate of ethmoid bone with cribriform foramina	25 Dorsum sellae	35 Supramastoid foramen
7 Incisive bone	18 Ethmoidal foramina	26 Petrosal part of temporal bone	36 Condylar canal
8 Incisor teeth	19 Body of presphenoid bone	27 Tympanic	37 Hypoglossal canal
9 Canine tooth		28 Internal carotid foramen	38 Jugular foramen
10 Premolar teeth		29 Canal for the trigeminal nerve	39 Occipital bone
11 Molar teeth			40 Pterygoid bone

47 Paramedian section of the skull of a dog.

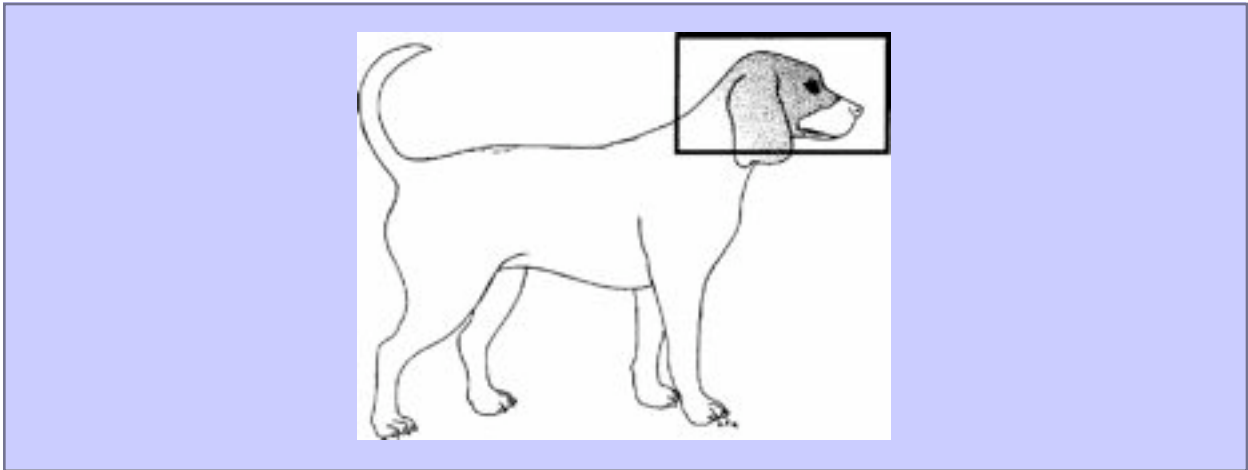


1 Interparietal bone	7 Ethmoidal foramina	13 Ventral nasal conchae	19 Body of presphenoid bone
2 Parietal bone	8 Dorsal lamina	14 Entrance to maxillary recess	20 Body of basisphenoid bone
3 Frontal bone	9 Endoturbinates (i-iv)	15 Sphenopalatine foramen	21 Pterygoid bone
4 Frontal sinus	10 Nasal bone	16 Palatine process of maxilla	22 Petrosal } part of
5 Ectoturbinates (i-iii)	11 Incisive bone	17 Horizontal plate of palatine bone	23 Tympanic } temporal bone
6 Cribriform plate	12 Dorsal nasal conchae	18 Nasopharyngeal meatus	24 Occipital bone

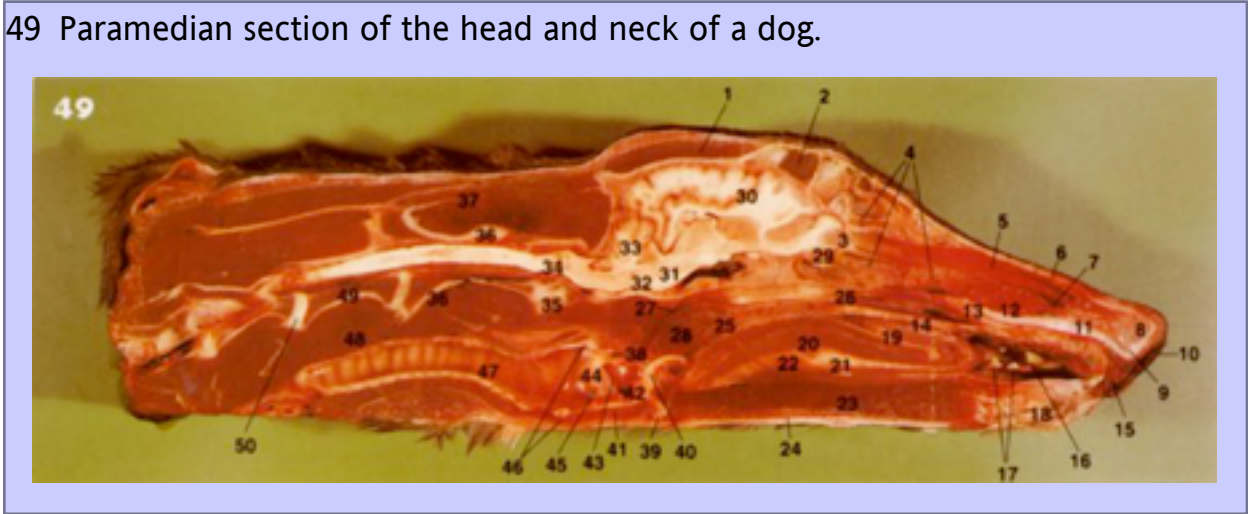
48 Median section of the head and neck of a dog, showing the left half of this region.



1 Frontal bone	26 Thalamus
2 Frontal sinus	27 Optic chiasma
3 Median septum	28 Site of hypophysis cerebri
4 Ethmoid bone	29 Pons
5 Osseous nasal septum	30 Transverse fibres of 29
6 Membranous septum	31 Medulla oblongata
7 Cartilaginous septum	32 Cerebellum
8 Incisive bone	33 Fourth ventricle
9 Upper incisor tooth	34 First cervical vertebra (atlas)
10 Mandible	35 Spinous process } of second cervical
11 Lower incisor tooth	36 Dens (odontoid process) } vertebra (axis)
12 Apex	37 Body of axis
13 Dorsum } of tongue	38 Intervertebral disc with annulus fibrosus and inner
14 Body	nucleus pulposus
15 Hard palate	39 Spinal cord
16 Vomer	40 Epiglottis
17 Choana	41 Arytenoid cartilage
18 M. genioglossus	42 Aditus laryngis
19 M. geniopharyngeus	43 Site of lateral ventricle
20 M. mylohyoideus	44 Thyroid cartilage
21 Olfactory bulb	45 Cricoid cartilage
22 Cerebral hemisphere	46 Trachea
23 Corpus callosum	47 Oesophagus
24 Third ventricle	48 Third cervical vertebra
25 Interthalamic adhesion	



49 Paramedian section of the head and neck of a dog.



1 M. temporalis	18 Mandible	35 First cervical vertebra (atlas)
2 Frontal sinus	19 Apex (reflected caudally)	36 Second cervical vertebra (axis)
3 Cribriform plate of ethmoid bone	20 Body	37 M. rectus capitis dorsalis
4 Ethmoidal conchae	21 Lyssa	38 Laryngopharynx
5 Dorsal nasal concha	22 M. genioglossus	39 Hyoid bone
6 Dorsal meatus	23 M. geniohyoideus	40 Epiglottis
7 Middle meatus	24 M. mylohyoideus	41 Thyroid cartilage
8 Alar fold	25 Soft palate	42 Vestibular fold
9 Cartilage of nasal septum	26 Choana	43 Lateral ventricle
10 External nares (nostrils)	27 Opening of auditory tube	44 Vocal process of arytenoid cartilage
11 Ventral meatus	28 Nasopharynx	45 Vocal fold
12 Ventral nasal concha	29 Olfactory bulb	46 Cricoid cartilage
13 Vomer	30 Cerebral hemisphere	47 Trachea
14 Hard palate	31 Pons	48 M. longus colli
15 Upper lip (labia superior)	32 Medulla oblongata	49 Body of third cervical vertebra
16 Canine teeth	33 Cerebellum	50 Intervertebral disc with outer annulus fibrosus and inner nucleus pulposus
17 Premolar teeth	34 Spinal cord	

2.0.6

Clinical Note

40 Note the relative positions of the epiglottis and the caudal edge of the soft palate. The epiglottis lies dorsal to the soft palate simulating the situation found during nasal breathing. To introduce an endotracheal tube via the oral cavity with the intention of entering the larynx and trachea in an anaesthetised dog would require that the soft palate be elevated dorsal to the epiglottis and then the tube could enter the aditus laryngis.

50 Paramedian section of the head of a dog revealing the structures of the left nasal cavity.



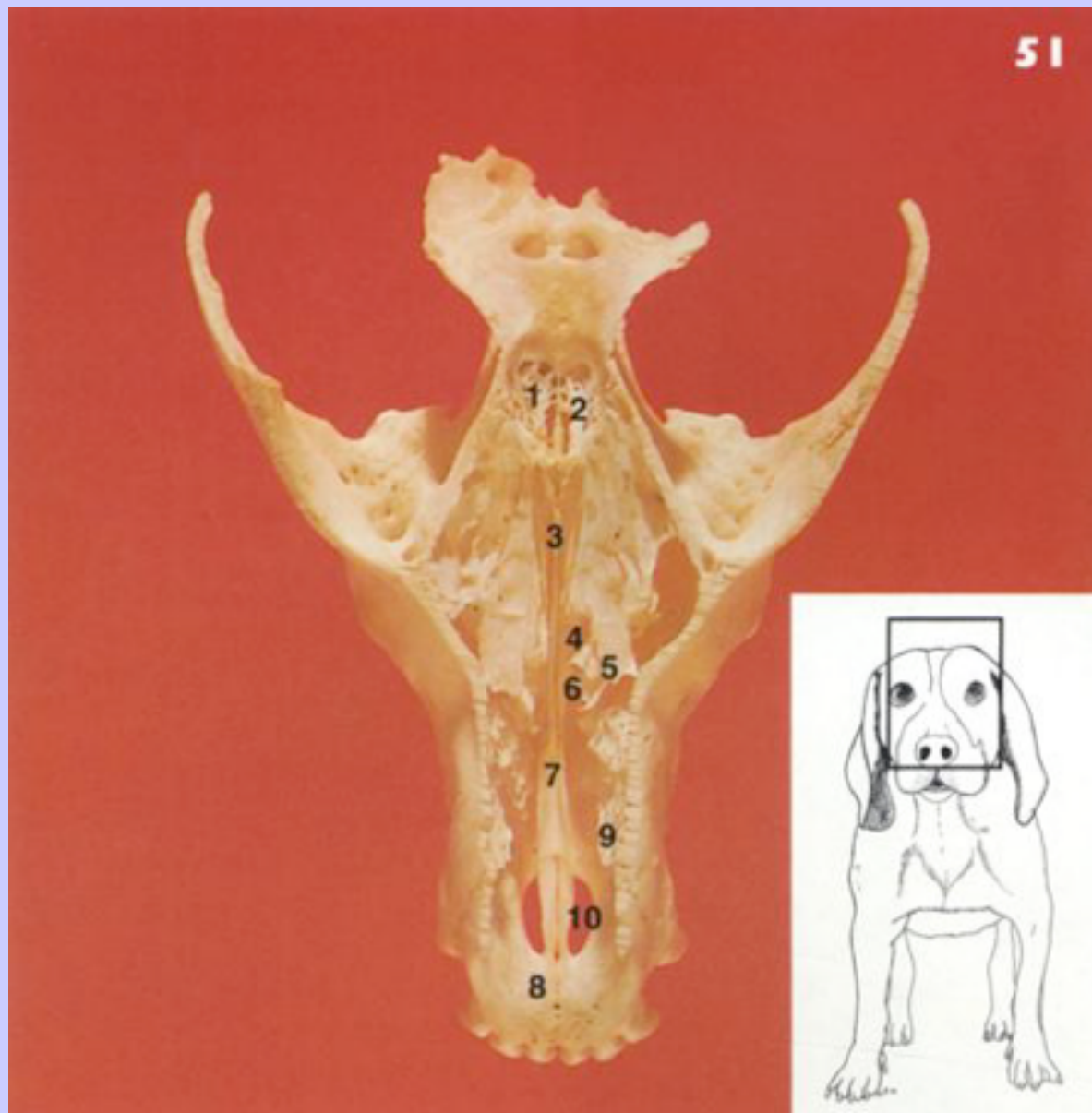
- 1 Frontal bone
- 2 Lateral part of frontal sinus
- 3 Ethmoidal conchae
- 4 Dorsal nasal concha
- 5 Ventral nasal concha
- 6 Lateral lamina of ethmoid bone

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- 7 Choana
- 8 Palatine bone
- 9 Maxilla
- 10 Incisive bone
- 11 Upper incisor tooth
- 12 Upper lip (labia superior)
- 13 Mandible
- 14 Body of tongue
- 15 M. genioglossus
- 16 M. geniohyoideus
- 17 M. pterygoideus medialis
- 18 M. temporalis
- 19 Temporal bone
- 20 Parietal bone
- 21 M. digastricus

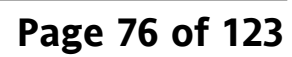
40

51 Nasal region of the skull of a dog, sectioned in the dorsal plane.



- | | | |
|---------------------------------|------------------------|-----------------|
| 1 Ethmoid bone | 6 Horizontal | } part of vomer |
| 2 Cribriform plate | 7 Sagittal | |
| 3 Perpendicular plate or lamina | 8 Incisive bone | |
| 4 Transverse lamina | 9 Ventral nasal concha | |
| 5 Endoturbinates | 10 Palatine fissure | |

52 Dorsal aspect of a coronal section through the head of a dog, at the level of the bony orbit, revealing the contents of the nasal cavity. The section has been made in the dorsal plane.



- | | |
|---------------------------------|----------------------|
| 1 M. temporalis | 13 Nares (nostrils) |
| 2 Cerebral hemispheres | 14 Maxilla |
| 3 Olfactory bulbs | 15 Lacrimal sac |
| 4 Cribriform plate | 16 Cornea |
| 5 Perpendicular plate | 17 Anterior chamber |
| | 18 Iris |
| 6 Dorsal nasal conchae | 19 Posterior chamber |
| 7 Ethmoidal conchae | 20 Pupil |
| 8 Median septum | 21 Ciliary body |
| 9 Cartilaginous septum | 22 Lens |
| 10 Alar fold | 23 Vitreous chamber |
| 11 Nasal vestibule | 24 Fundus |
| 12 Opening of nasolacrimal duct | 25 Orbit |

41

53 Dorsal aspect of an oblique section in the dorsal plane, made through the head of a dog at the level of the orbit. The structure of the eyeball and the orbital contents are shown.

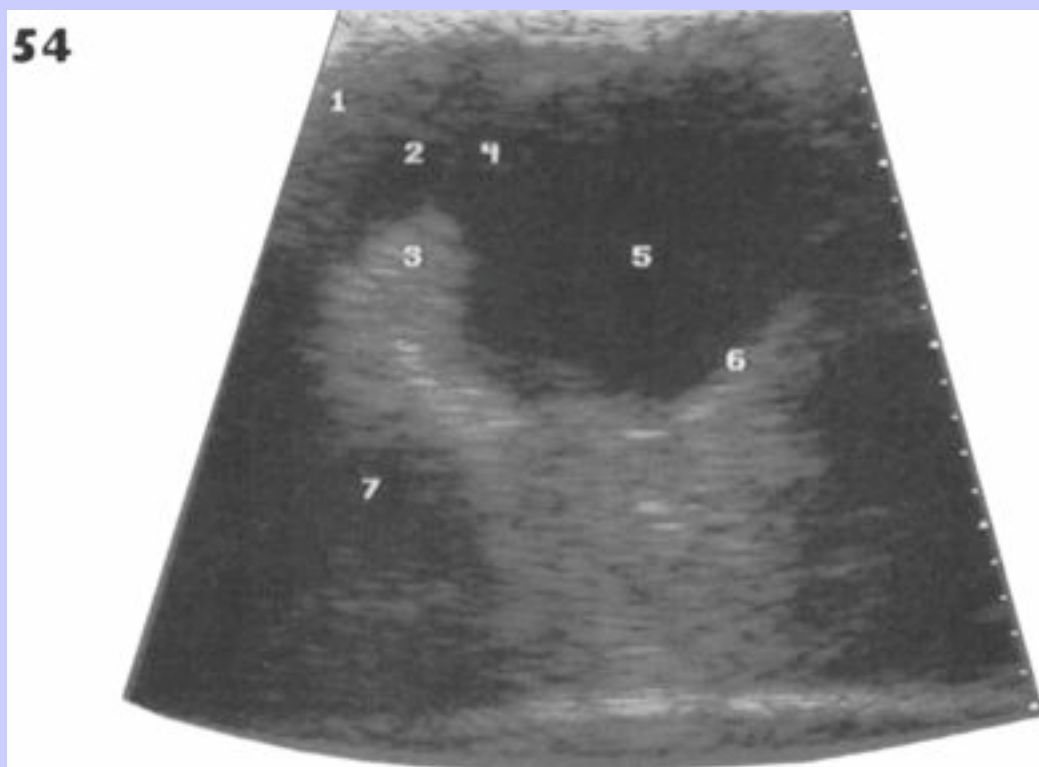
42



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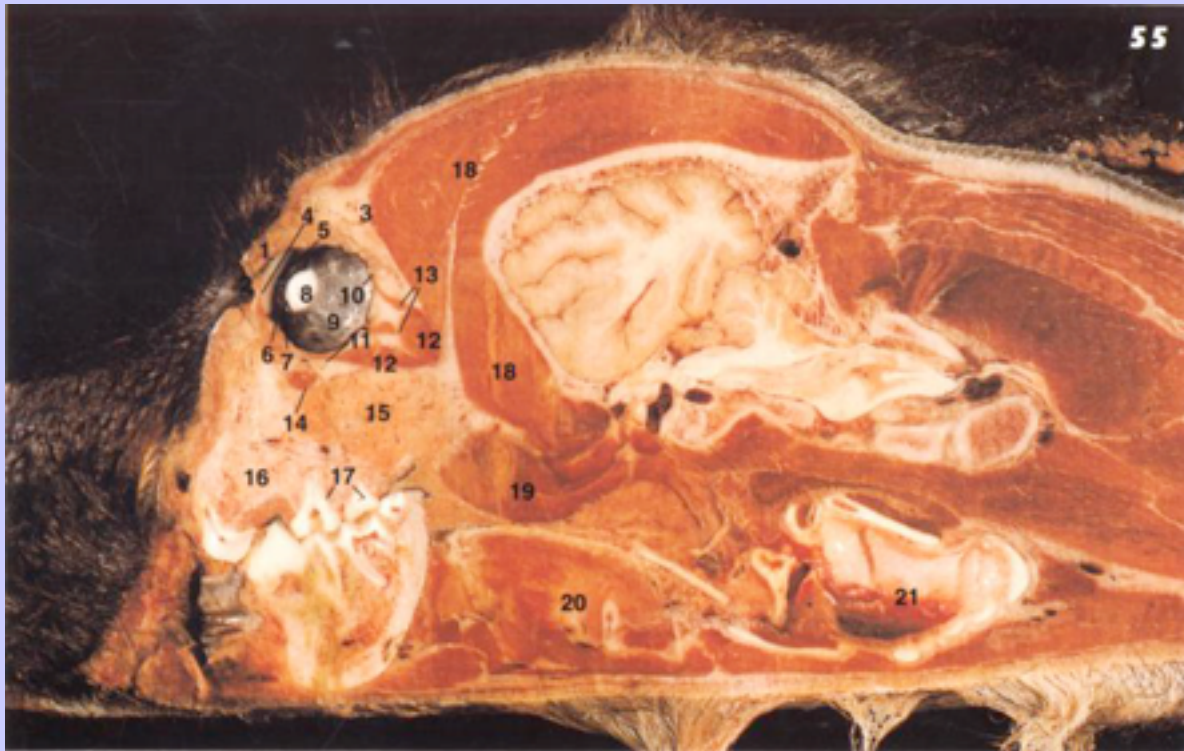
- 
- 1 Bulbar conjunctiva covering cornea
 - 2 Cornea
 - 3 Anterior chamber
 - 4 Iris
 - 5 Posterior chamber
 - 6 Pupil
 - 7 Lens
 - 8 Ciliary body
 - 9 Vitreous chamber
 - 10 Fundus
 - 11 Sclera
 - 12 M. retractor bulbi
 - 13 Mm. recti
 - 14 Optic nerve
 - 15 Periorbita
 - 16 M. temporalis

54 Ultrasound scan of the eye of a dog, demonstrating the contents of the bulb of the eye. The healthy lens is almost echolucent, but its position is marked (4). The plane of the scan is horizontal and corresponds to [Fig. 53](#).



- 1 Corneal surface
- 2 Anterior chamber
- 3 Ciliary body
- 4 Lens
- 5 Vitreous chamber
- 6 Caudal scleral surface (with retrobulbar contents distal to it)
- 7 Medial aspect of orbit

55 Lateral aspect of a sagittal section through the head of a dog. The structure of the eyeball and the orbital contents are shown.



- 1 Upper eyelid (palpebra superior)
- 2 Medial commissure
- 3 Frontal bone
- 4 Conjunctival sac
- 5 Cornea
- 6 Anterior chamber
- 7 Ciliary body
- 8 Lens
- 9 Vitreous chamber
- 10 Retinal layer
- 11 Choroid

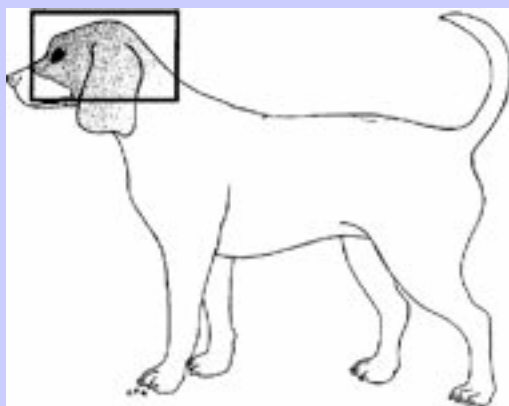
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- 12 Mm. recti
- 13 M. retractor bulbi
- 14 M. obliquus ventralis
- 15 Zygomatic gland
- 16 Maxilla
- 17 Upper molar teeth
- 18 M. temporalis
- 19 M. pterygoideus
- 20 Tongue
- 21 Larynx

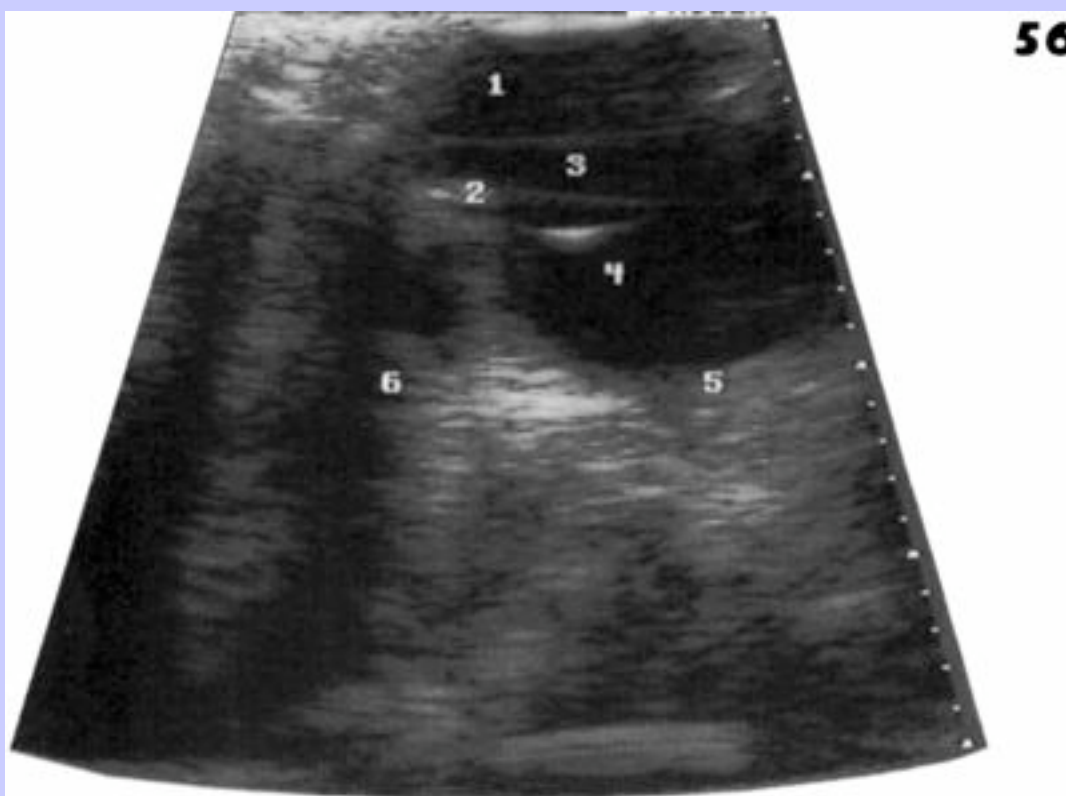
2.0.7

Clinical Note

This section of the head gives an anatomical plane similar to that in a vertical ultrasound scan of the eye.

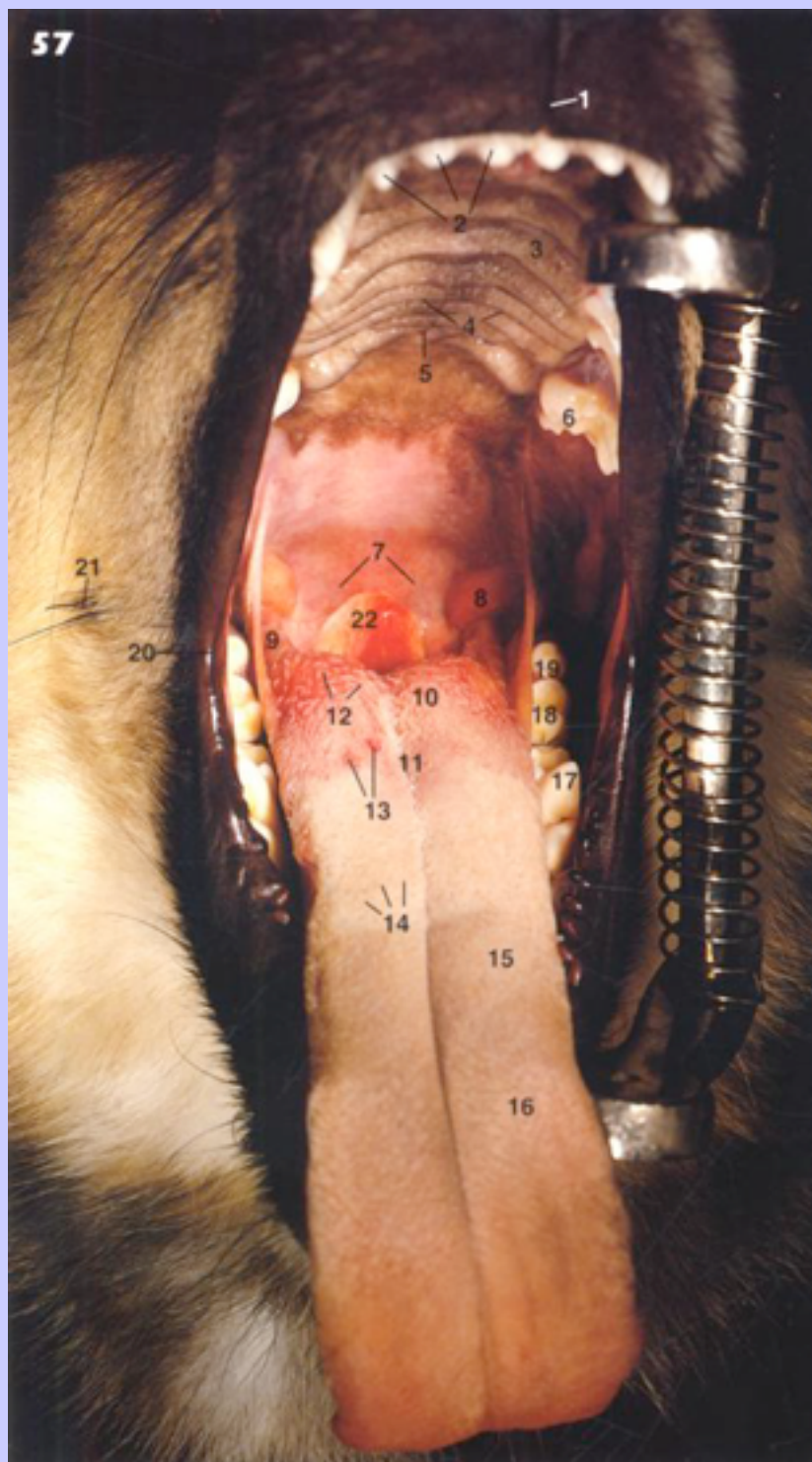


56 Ultrasound scan of the eye of a dog, demonstrating the contents of the bulb of the eye (eyeball). The plane of the scan is vertical and corresponds to [Fig. 55](#). The caudal surface of the lens is indicated by a white line between 3 and 4, which is due to specular reflection from the lens surface.



- 1 Anterior chamber
- 2 Ciliary body
- 3 Lens
- 4 Vitreous chamber
- 5 Optic disc region
- 6 Ventral aspect of the orbit

57 Rostral aspect of the open oral cavity, revealing the structures of the caudal oral cavity



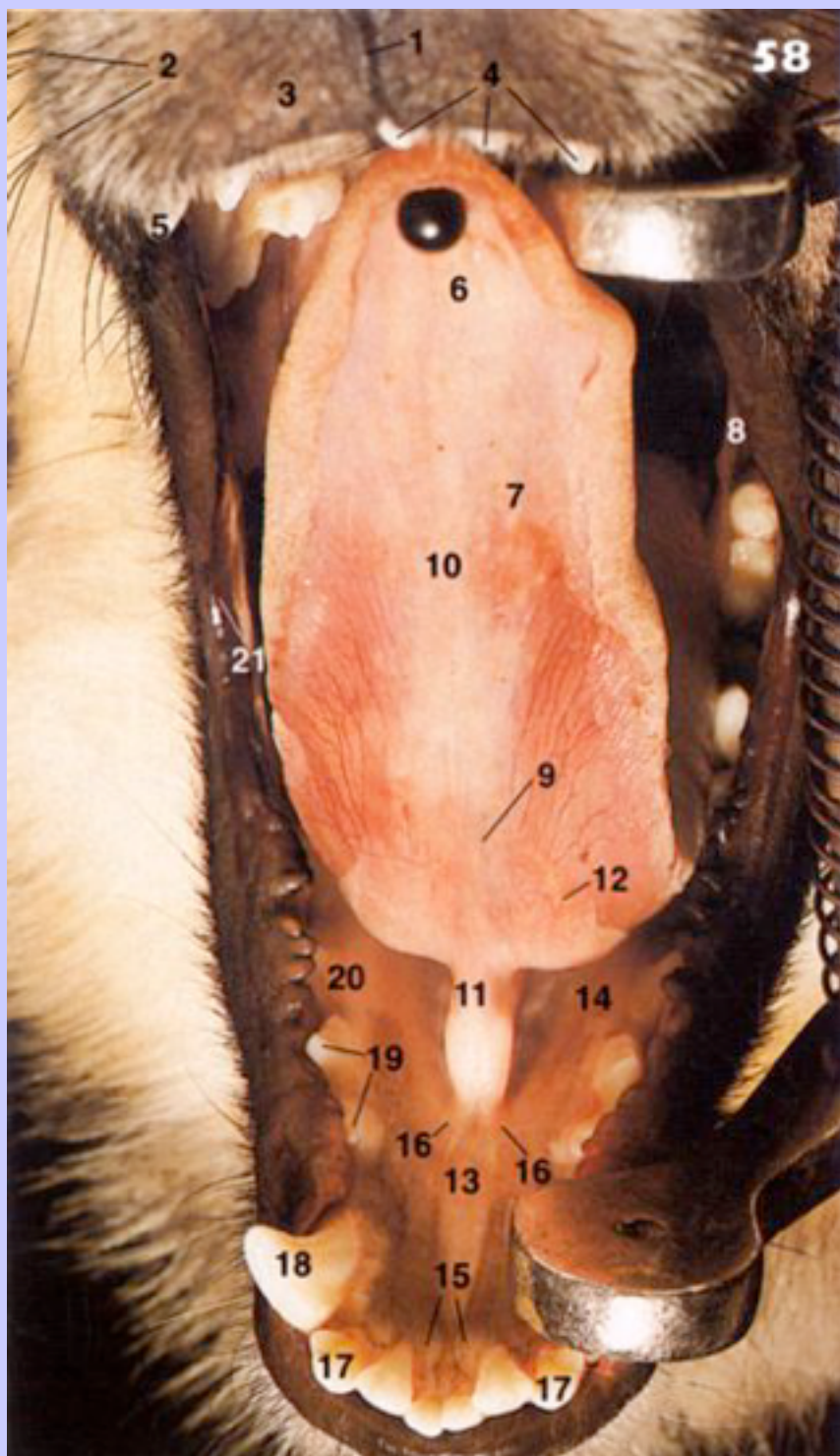
1 Philtrum	12 Filiform papillae
2 Upper incisor teeth	13 Vallate papillae
3 Hard palate	14 Fungiform papillae
4 Palatine ridges	15 Body } of tongue
5 Palatine raphe	16 Dorsal face }
6 Fourth upper premolar (carnassial) tooth	17 First } lower molar tooth
7 Soft palate	18 Second }
8 Palatine tonsils in crypt	19 Third }
9 Palatoglossal arch	20 Angle of mouth
10 Root of tongue	21 Vibrissae
11 Median groove	22 Epiglottis

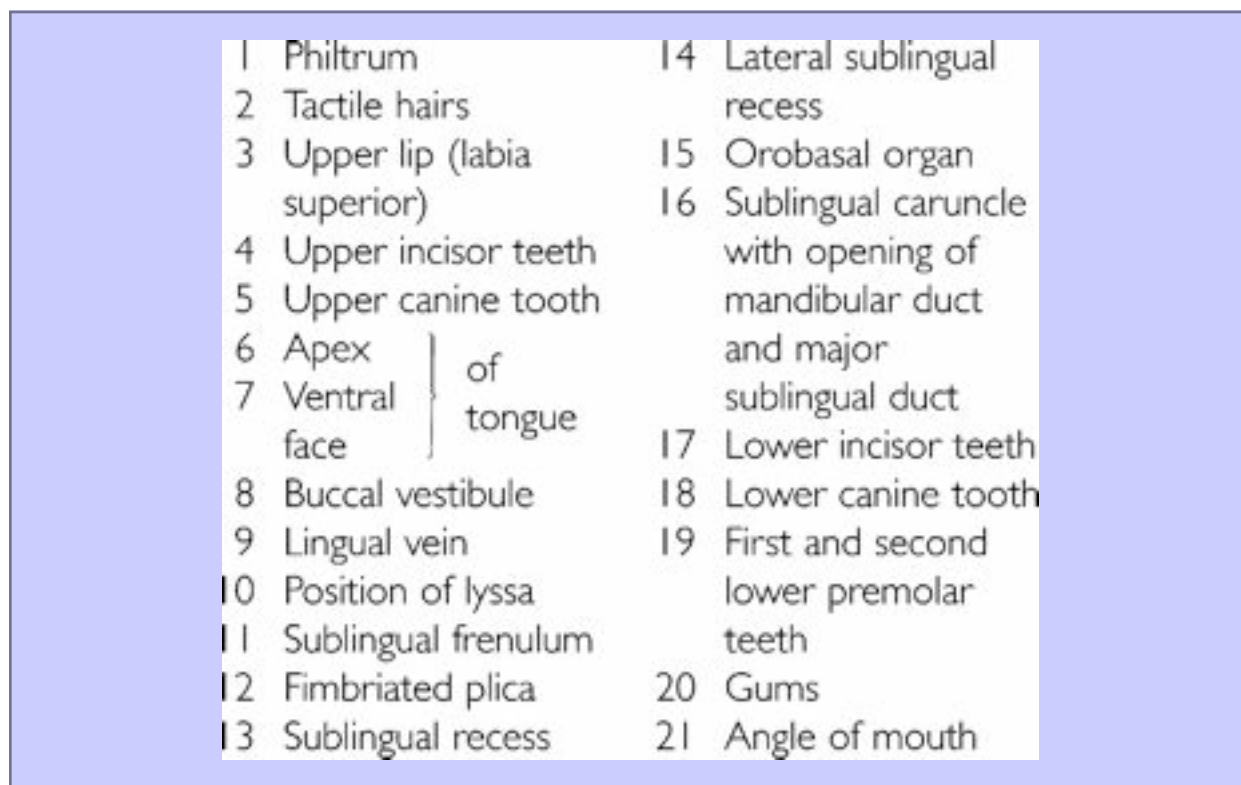
2.0.8 Clinical Note

- 7 Note that the soft palate lies dorsal to the free edge of the epiglottis, simulating the position found in oral breathing. This is the required relative positioning of the epiglottis and soft palate in order to facilitate the introduction of an endotracheal tube via the oral route.
- 8 The palatine tonsil is normally obscured by the overlying mucosa of the crypt. During clinical examination an attempt is made to visualise the tonsil which will become enlarged in the infective state and be readily visible bulging from its crypt.

44

58 Rostral aspect of the oral cavity of a dog. The tongue has been elevated dorsally to reveal the ventral floor of the oral cavity.



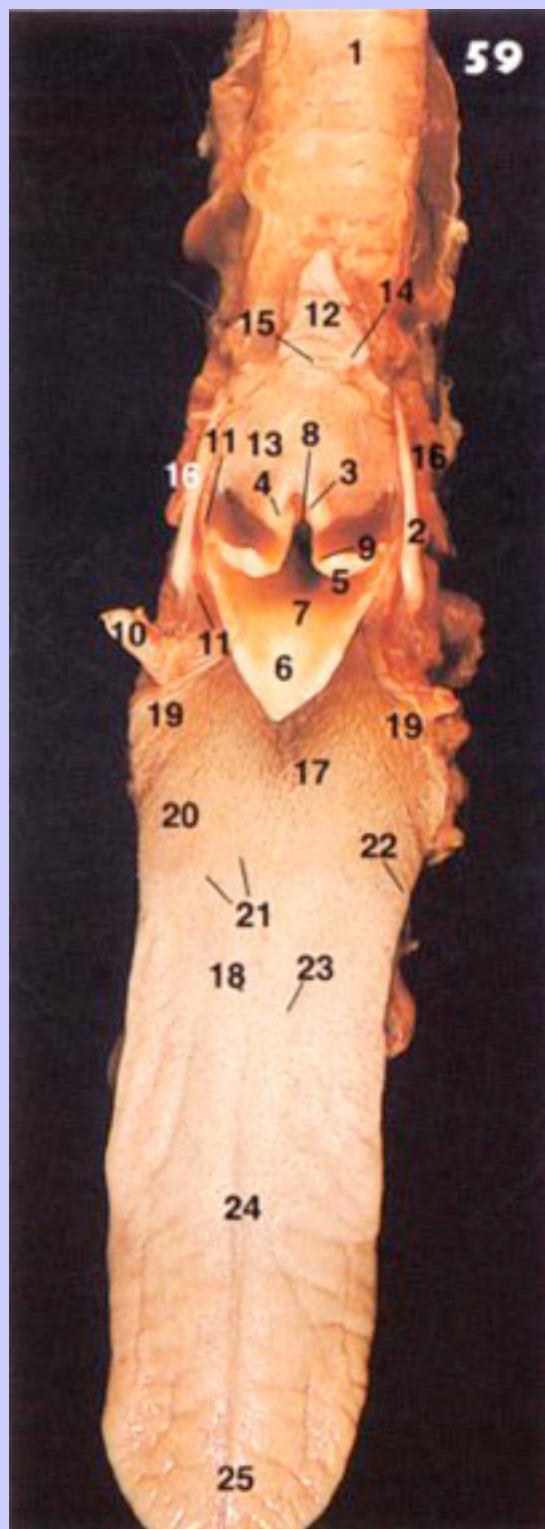


2.0.9

Clinical Note

16 In clinical cases where it is suspected that there is an occlusion of the ducts of either the mandibular or the monostomatic sublingual salivary glands, the caruncle is identified and the duct openings cannulated in order to introduce radio-opaque material to discover the patency of the ducts. Example of such a radiograph are shown in [Figs 61](#) and [62](#).

59 Dorsal aspect of the tongue and larynx of a dog.



- 
- 1 Trachea
 - 2 Dorsal border of thyroid cartilage
 - 3 Corniculate process of arytenoid cartilage
 - 4 Corniculate } tubercle
 - 5 Cuneiform }
 - 6 Epiglottis
 - 7 Laryngeal inlet
 - 8 Interarytenoid groove
 - 9 Aryepiglottic fold
 - 10 Hyoid bone
 - 11 Piriform recess
 - 12 Oesophagus
 - 13 Caudal part of laryngopharynx
 - 14 Pharyngo-oesophageal junction
 - 15 Limen pharyngoesophageum
 - 16 Palatopharyngeal arch
 - 17 Root } of tongue
 - 18 Body }
 - 19 Palatoglossal fold
 - 20 Filiform papillae
 - 21 Vallate papillae
 - 22 Foliate papillae
 - 23 Fungiform papillae
 - 24 Median groove (sulcus)
 - 25 Apex of tongue

60 Ventral aspect of a section of the head of a dog, made in the dorsal plane through the digestive tube.



- 1 Philtrum
- 2 Incisive papilla
- 3 Orifice of incisive duct
- 4 Incisor teeth
- 5 Hard palate
- 6 Canine teeth
- 7 Premolar teeth
- 8 Molar teeth
- 9 Orifice of parotid duct
- 10 Region of orifices of zygomatic ducts
- 11 Soft palate
- 12 Mandible
- 13 M. buccinator
- 14 M. styloglossus
- 15 Epihyoid bone
- 16 M. masseter
- 17 Hypoglossal nerve
- 18 Pharyngeal muscles
- 19 M. digastricus
- 20 Mandibular lymph node
- 21 Thyroid cartilage
- 22 Common carotid artery
- 23 Vagosympathetic trunk
- 24 Thyroid gland
- 25 Oesophagus
- 26 Annular fold

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27 Dorsal wall of laryngeal pharynx

28 Pharyngeal isthmus

29 Palatopharyngeal arch

30 Palatine tonsil

31 Mandibular salivary gland

45

61 Lateral radiograph of the head of a dog. To demonstrate the position of the mandibular salivary gland, radio-opaque material has been injected into the duct of the gland.

46



- 1 Needle inserted into orifice of duct of mandibular salivary gland at sublingual caruncle
- 2 Duct of mandibular salivary gland
- 3 Mandibular salivary gland
- 4 Hyoid bone

62 Lateral radiograph of the head of a dog. Radio-opaque material has been injected into the duct of the monostomatic sublingual salivary gland to outline its course and the glandular tissue.



- 1 Needle inserted into orifice of duct of monostomatic sublingual salivary gland at sublingual caruncle
- 2 Duct of monostomatic sublingual salivary gland
- 3 Glandular tissue around duct
- 4 Portion of monostomatic sublingual salivary gland encapsulated with mandibular salivary gland

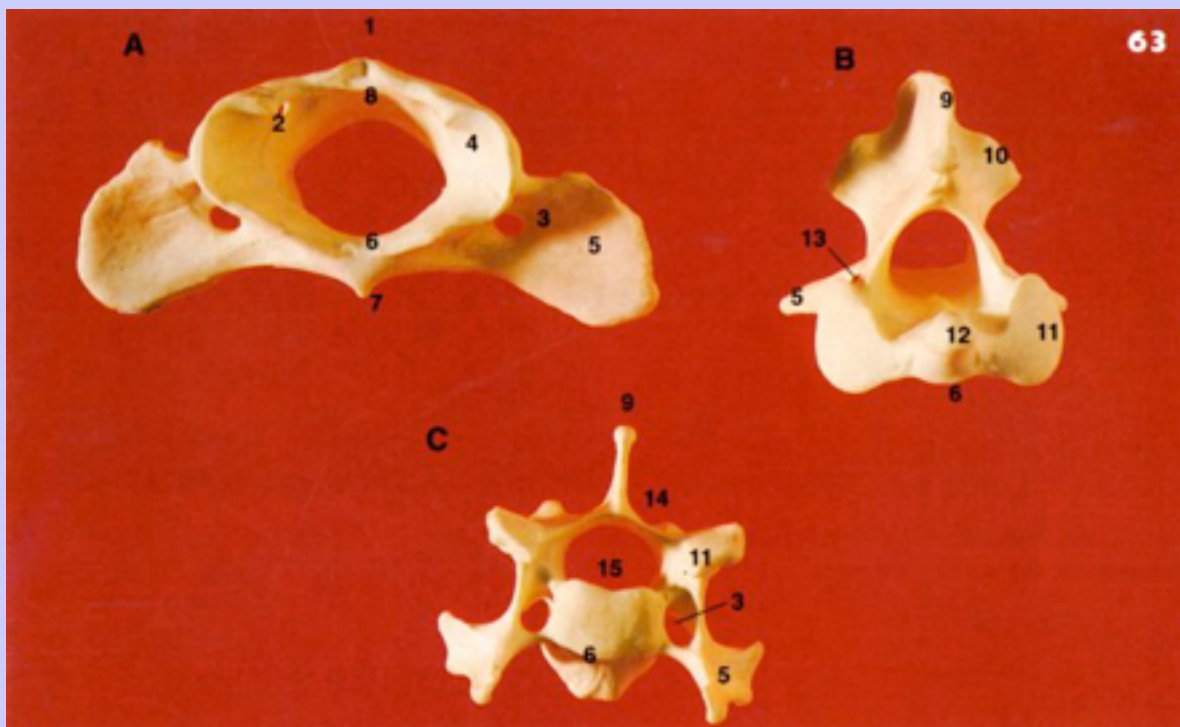
5 Endotracheal tube

6 Hyoid bone

46

63 Cranial aspect of the first (atlas) (A), second (axis) (B), and fifth cervical vertebrae (C) of a dog.

47



1 Dorsal tubercle

2 Lateral vertebral foramen

3 Transverse foramen

4 Cranial articular fovea

5 Transverse process (wing of atlas)

6 Body

7 Ventral tubercle

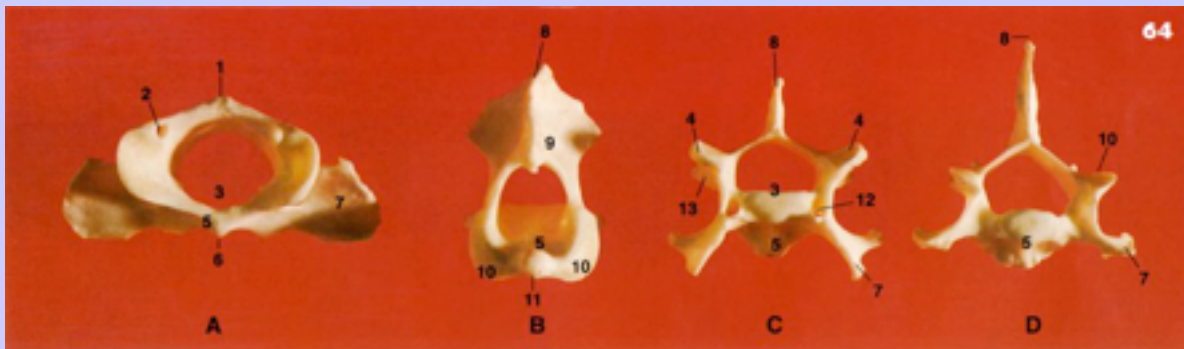
8 Dorsal arch

9 Spinous process

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- 10 Caudal articular process
- 11 Cranial articular surface
- 12 Dens (odontoid process)
- 13 Transverse canal
- 14 Lamina
- 15 Vertebral foramen

64 Cranial aspect of the first (atlas) (A), second (axis) (B), fifth (C) and seventh cervical vertebrae (D) of a cat.



- 1 Dorsal tubercle
- 2 Lateral vertebral foramen
- 3 Vertebral foramen
- 4 Cranial articular fovea
- 5 Body
- 6 Ventral tubercle
- 7 Transverse process (wing of atlas)
- 8 Spinous process
- 9 Arch
- 10 Cranial articular surface
- 11 Dens (odontoid process)

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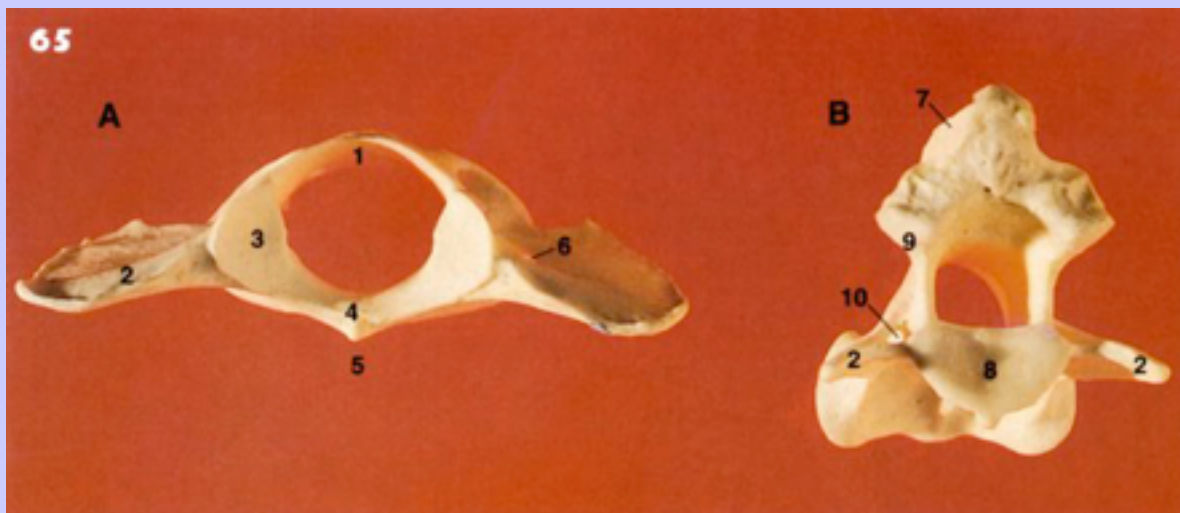
12 Transverse foramen

13 Caudal articular process

47

65 Caudal aspect of the first (atlas) (A) and second (axis) (B) cervical vertebrae of a dog.

48



1 Arch

2 Transverse process

3 Caudal articular fovea

4 Fovea for dens (odontoid process)

5 Ventral tubercle

6 Transverse foramen

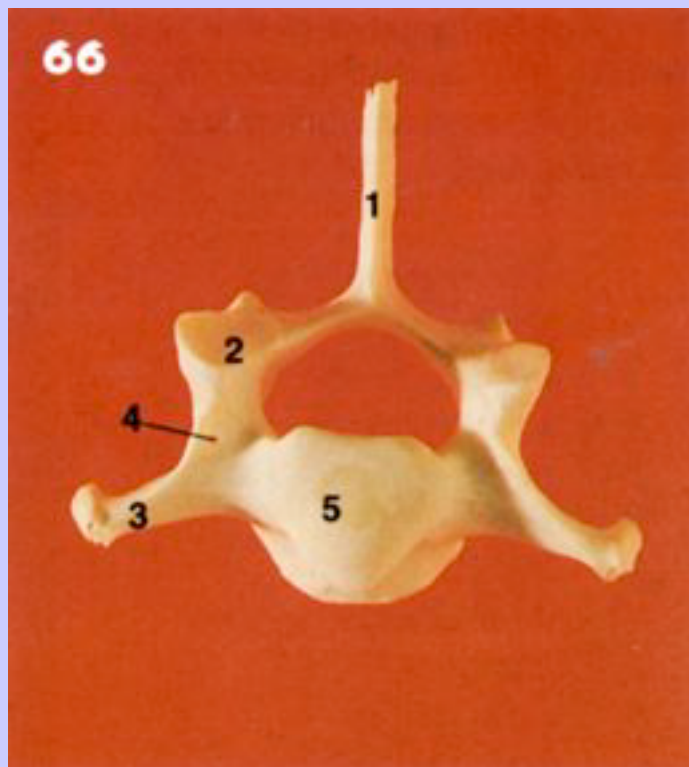
7 Spinous process

8 Body of axis

9 Caudal articular process

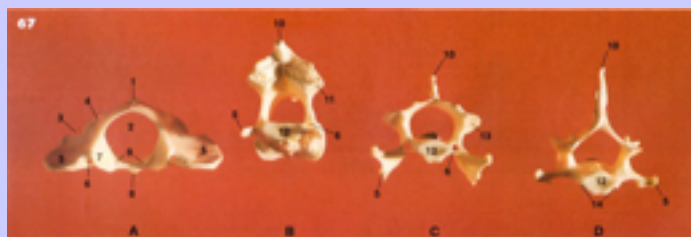
10 Transverse foramen


66 Cranial aspect of the seventh cervical vertebra of a dog.



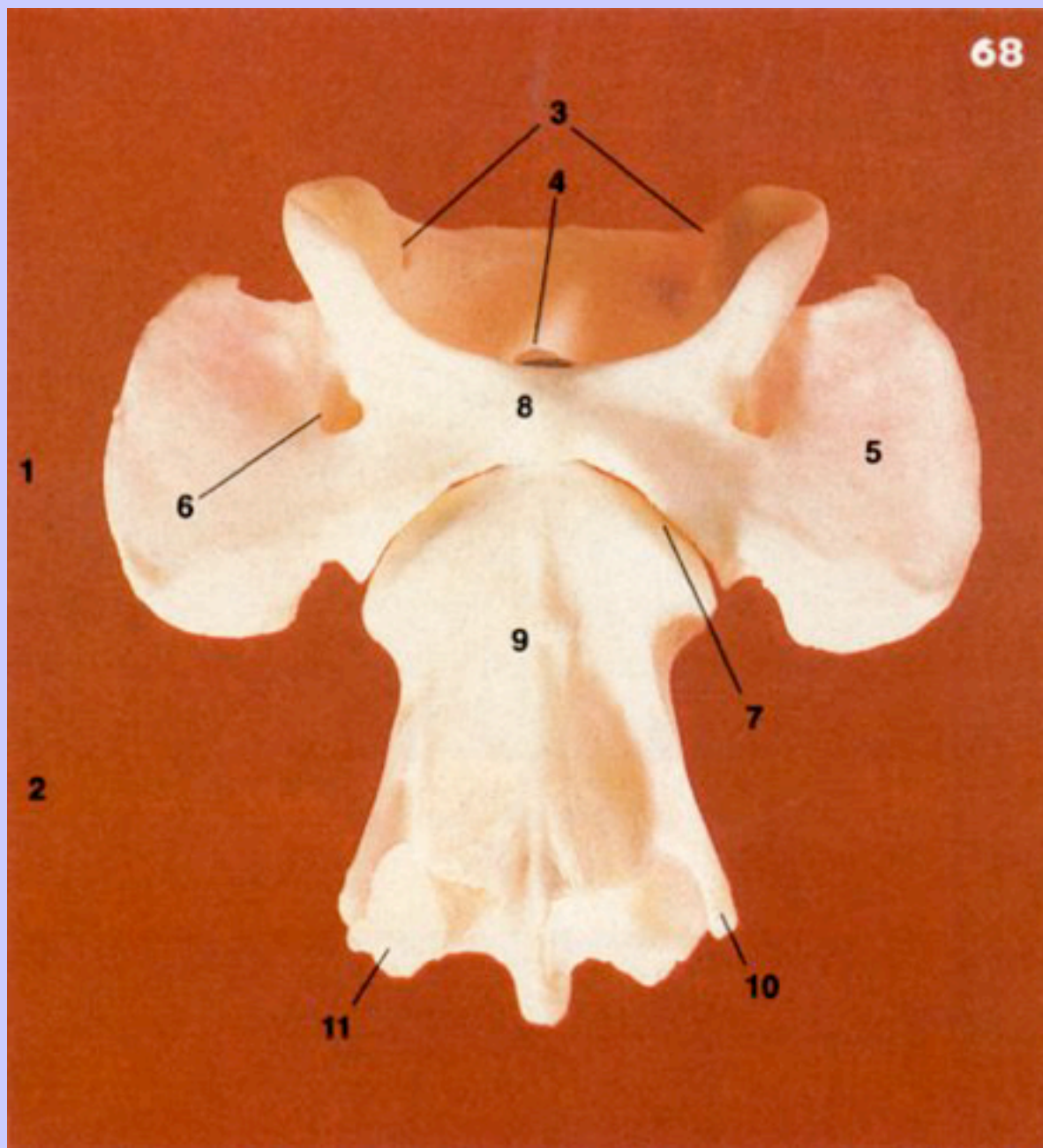
- 1 Spinous process
- 2 Cranial articular surface
- 3 Transverse process
- 4 Transverse foramen
- 5 Body

67 Caudal aspect of the first (atlas) (A), second (axis) (B), fifth (C) and seventh cervical vertebrae (D) of a cat.



- 
- 1 Dorsal tubercle
 - 2 Vertebral foramen
 - 3 Alar notch
 - 4 Lateral vertebral foramen
 - 5 Transverse process
 - 6 Transverse foramen
 - 7 Caudal articular fovea
 - 8 Ventral tubercle
 - 9 Fovea of dens
 - 10 Spinous process
 - 11 Caudal articular surface
 - 12 Body
 - 13 Caudal articular surface
 - 14 Caudal costal fovea

68 Ventral aspect of the first (atlas) and second (axis) cervical vertebrae of a cat.

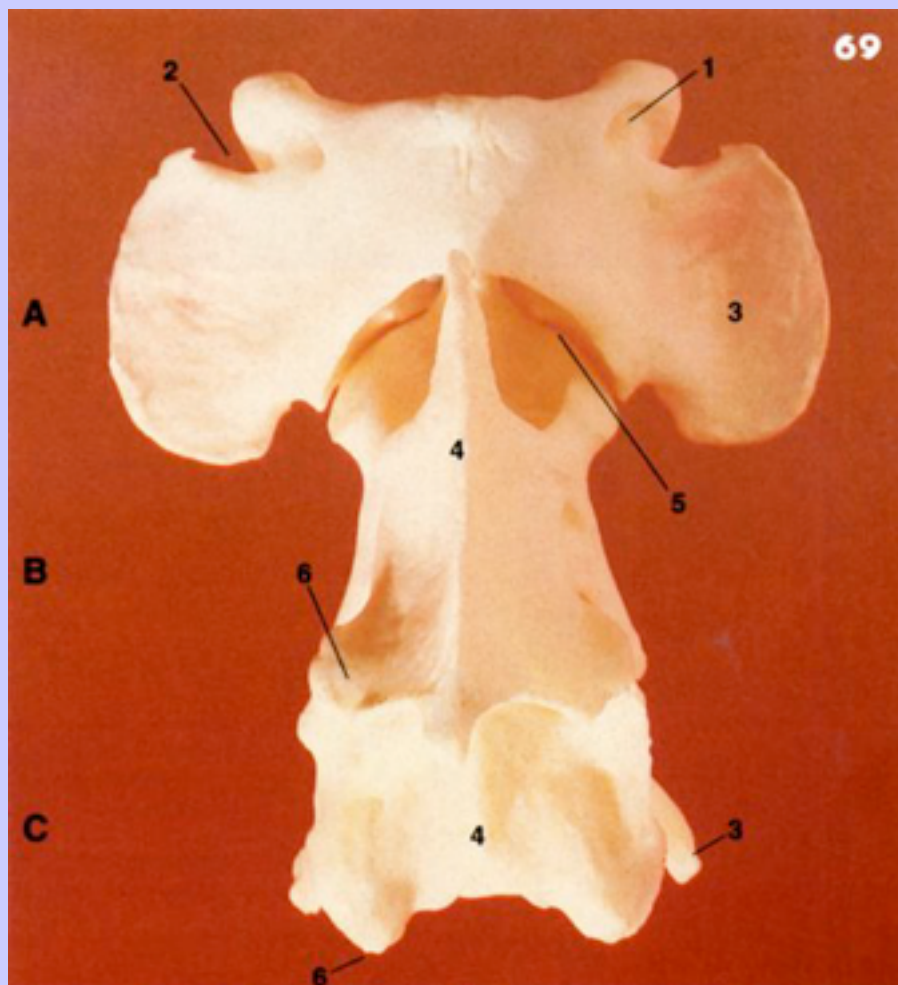


- 1 Atlas
- 2 Axis
- 3 Cranial articular fovea

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- 4 Dens (odontoid process)
- 5 Wing of atlas
- 6 Transverse foramen
- 7 Atlantoaxial articulation
- 8 Ventral tubercle
- 9 Body
- 10 Transverse process
- 11 Caudal articular surface

69 Dorsal aspect of the first (A) (atlas), second (axis) (B), and third (C) cervical vertebrae of a cat.

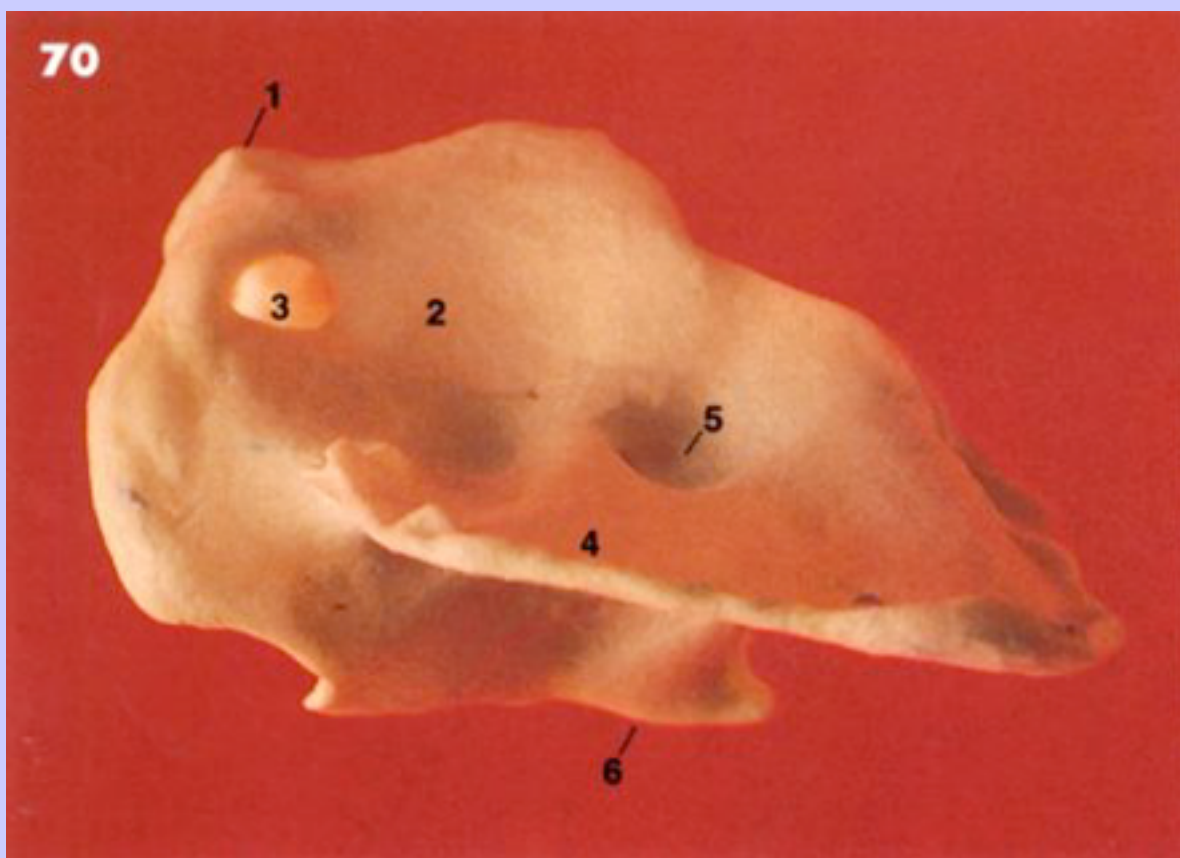


- 1 Lateral vertebral foramen
- 2 Alar notch
- 3 Transverse process
- 4 Spinous process
- 5 Atlantoaxial articulation
- 6 Caudal articular process

49

70 Lateral aspect of the first cervical vertebra (atlas) of a dog.

50



- 1 Dorsal tubercle
- 2 Arch
- 3 Lateral vertebral foramen

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- 4 Transverse process (wing of atlas)
- 5 Transverse foramen
- 6 Ventral tubercle

71 Lateral aspect of the second cervical vertebra (axis) of a dog.



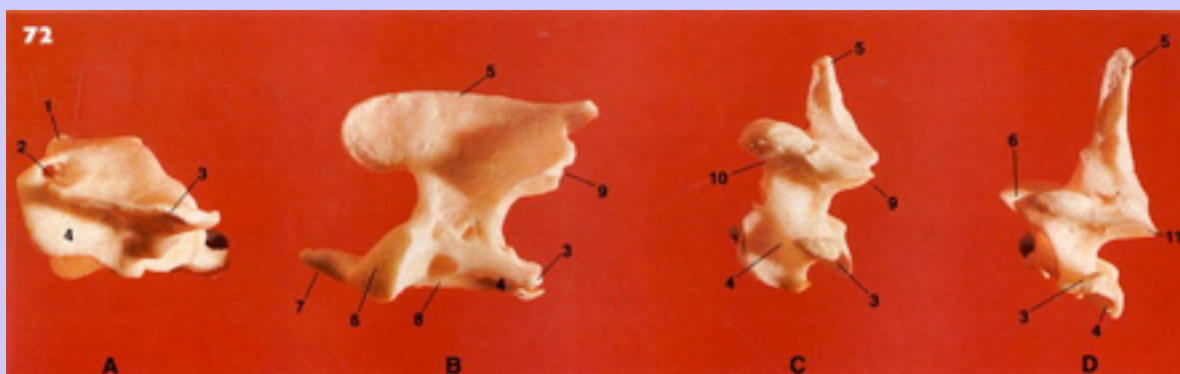
- 1 Spinous process
- 2 Arch
- 3 Dens (odontoid process)
- 4 Cranial articular surface
- 5 Body
- 6 Transverse foramen

- 7 Caudal articular process
- 8 Transverse process
- 9 Median ventral crest

50

72 Left lateral aspect of the first (atlas) (A), second (axis) (B), fifth (C) and seventh (D) cervical vertebrae of a cat.

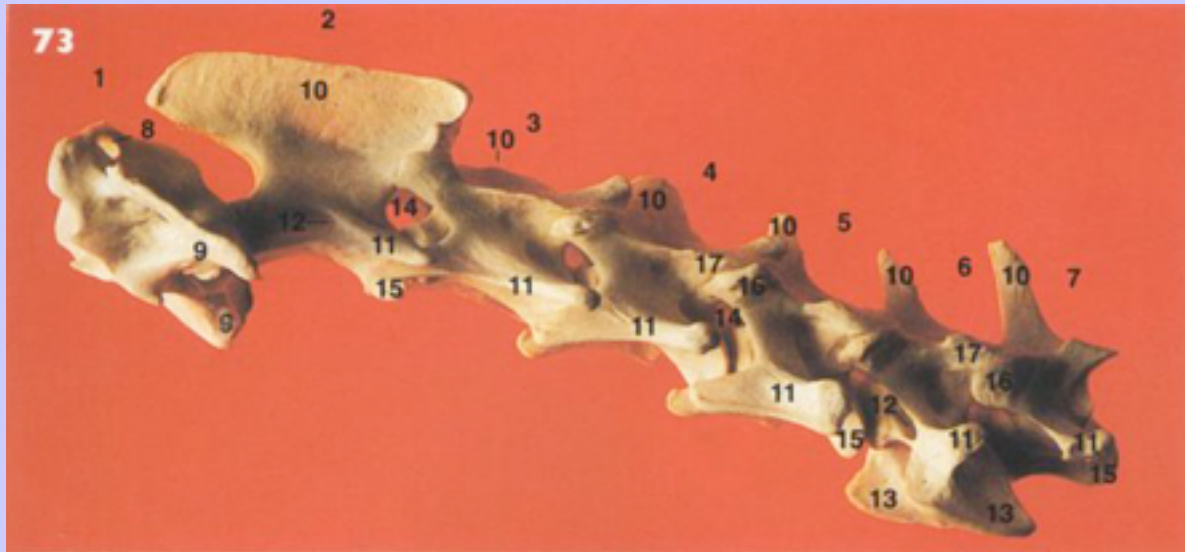
51



- 1 Dorsal tubercle
- 2 Lateral vertebral foramen
- 3 Transverse process
- 4 Body
- 5 Spinous process
- 6 Cranial articular surface
- 7 Dens (odontoid process)
- 8 Transverse foramen
- 9 Caudal articular process
- 10 Cranial articular process
- 11 Caudal articular surface

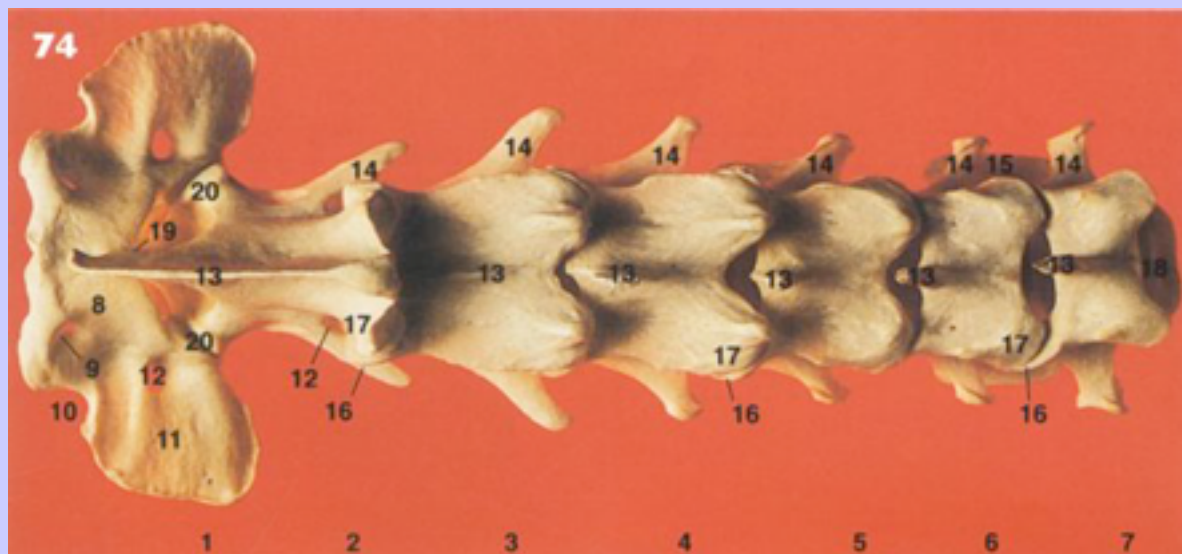
51

73 Lateral aspect of the articulated cervical vertebrae of a dog.



- | | | |
|----|---|-------------------------|
| 1 | First (atlas) | } cervical
vertebrae |
| 2 | Second (axis) | |
| 3 | Third | |
| 4 | Fourth | |
| 5 | Fifth | |
| 6 | Sixth | |
| 7 | Seventh | |
| 8 | Lateral vertebral foramen | |
| 9 | Wing of I | |
| 10 | Spinous process | |
| 11 | Transverse process | |
| 12 | Transverse foramen | |
| 13 | Expanded plate of transverse process of 6 | |
| 14 | Intervertebral foramen | |
| 15 | Body | |
| 16 | Cranial articular process | |
| 17 | Caudal articular process | |

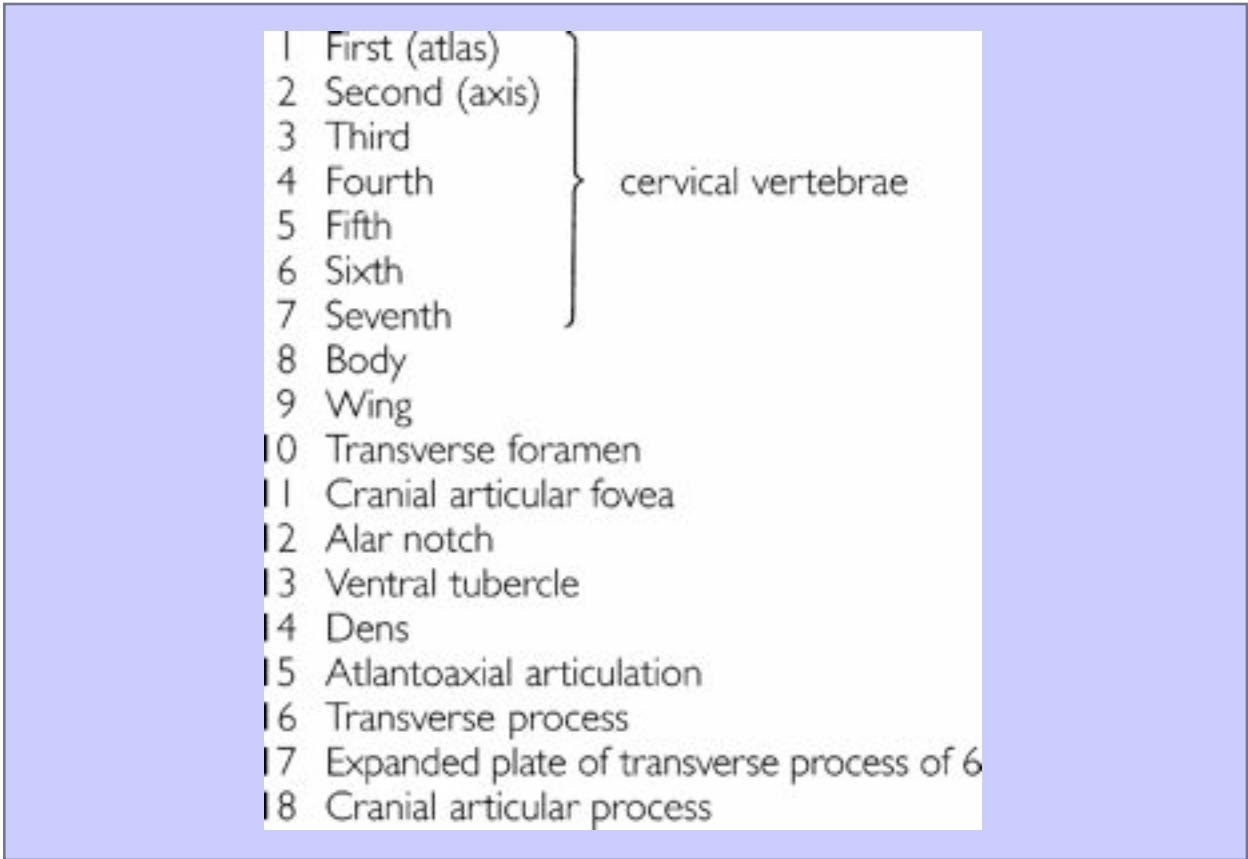
74 Dorsal aspect of the articulated cervical vertebrae of a dog.



- | | | | |
|-----------------|-------------------------|-----------------------------|---|
| 1 First (atlas) | } cervical
vertebrae | 8 Arch | 15 Expanded plate of
transverse process of 6 |
| 2 Second (axis) | | 9 Lateral vertebral foramen | 16 Cranial articular process |
| 3 Third | | 10 Alar notch | 17 Caudal articular process |
| 4 Fourth | | 11 Wing of I | 18 Body |
| 5 Fifth | | 12 Transverse foramen | 19 Dens |
| 6 Sixth | | 13 Spinous process | 20 Atlantoaxial articulation |
| 7 Seventh | | 14 Transverse process | |

75 Ventral aspect of the articulated cervical vertebrae of a dog.



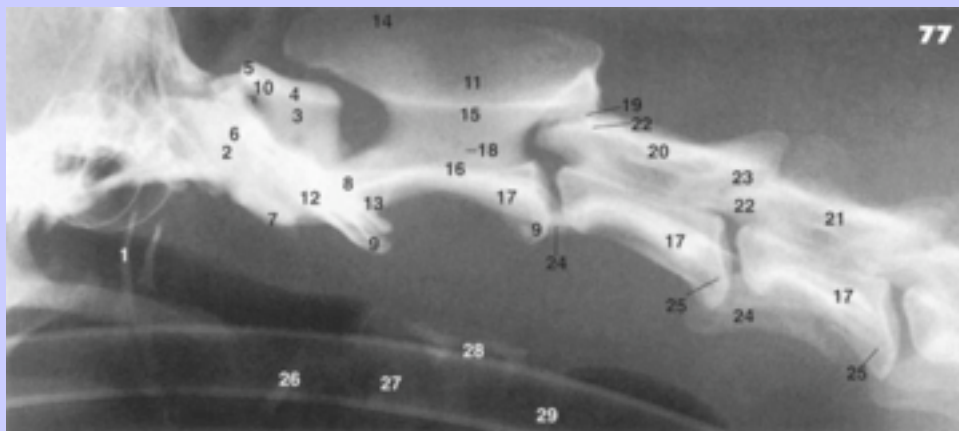


76 Lateral radiograph of the cervical portion of the vertebral column of a dog.



- | | | |
|------------------------------------|---|-----------------------|
| 1 First (atlas) | } | cervical
vertebrae |
| 2 Second (axis) | | |
| 3 Third | | |
| 4 Fourth | | |
| 5 Fifth | | |
| 6 Sixth | | |
| 7 Seventh | | |
| 8 First | } | thoracic vertebrae |
| 9 Second | | |
| 10 Scapula | | |
| 11 First | } | rib |
| 12 Second | | |
| 13 Body | | |
| 14 Spinous process | | |
| 15 Cranial articular process | | |
| 16 Caudal articular process | | |
| 17 Location of intervertebral disc | | |
| 18 Fovea for articulation of rib | | |
| 19 Intervertebral foramen | | |

77 Lateral radiograph of the cranial cervical portion of the vertebral column of a dog.

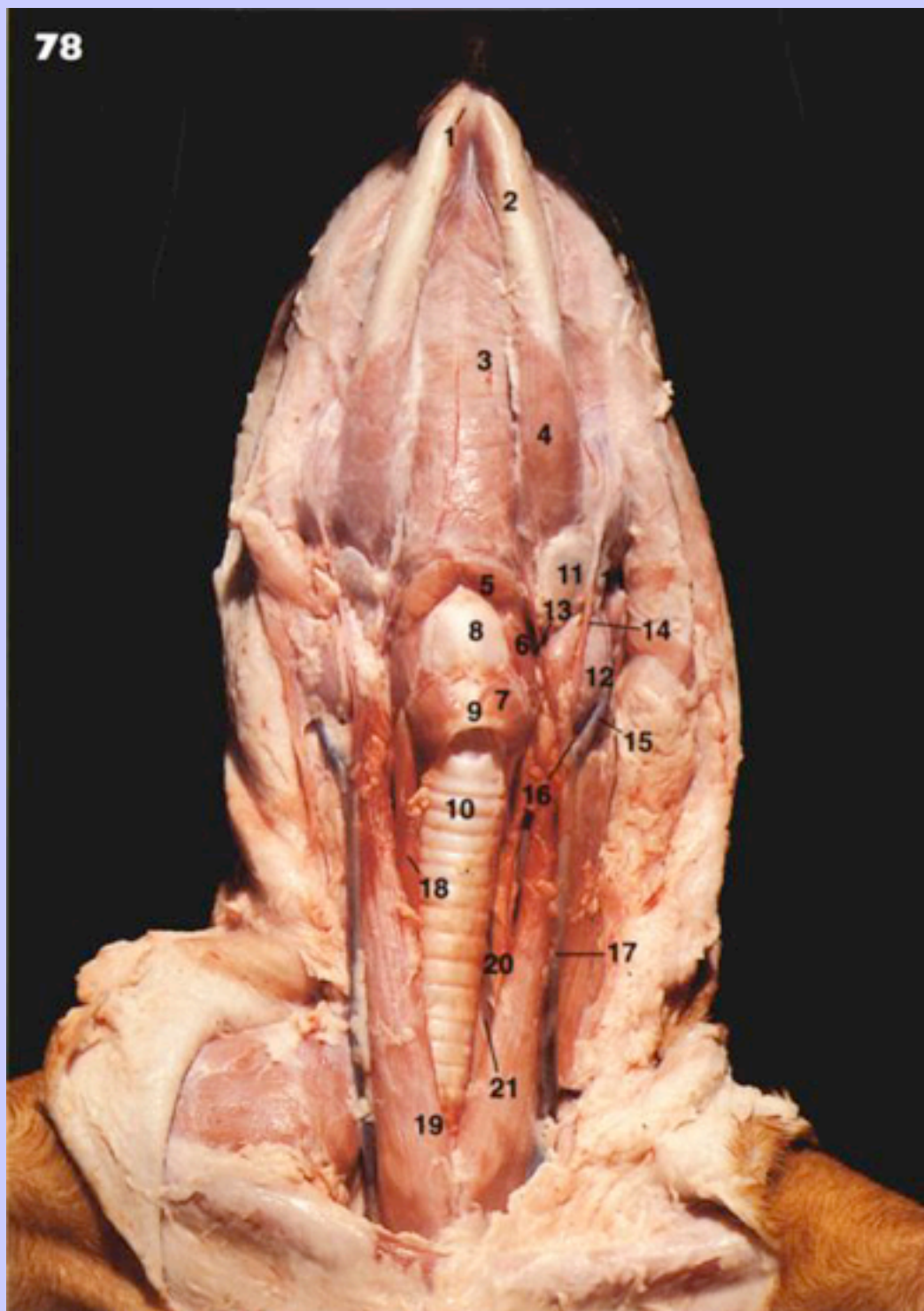


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- | | | |
|---------------------------------------|-------------------------------------|---|
| 1 Stylohyoid bone | 15 Dorsal border | } of vertebral foramen
(vertebral canal) |
| 2 Occipital condyle | 16 Ventral border | |
| 3 First cervical vertebra (atlas) | 17 Body | |
| 4 Dorsal arch | 18 Transverse foramen | |
| 5 Dorsal tubercle | 19 Articular processes | |
| 6 Border of cranial articular surface | 20 Third | } cervical vertebra |
| 7 Ventral arch | 21 Fourth | |
| 8 Border of caudal articular surface | 22 Cranial articular process | |
| 9 Transverse process | 23 Caudal articular process | |
| 10 Lateral vertebral foramen | 24 Cranial extension | } of transverse process |
| 11 Second cervical vertebra (axis) | 25 Caudal extension | |
| 12 Dens | 26 Thyrohyoid bone | |
| 13 Cranial articular surface | 27 Thyroid cartilage | |
| 14 Spinous process | 28 Cricoid cartilage | |
| | 29 Trachea (with endotracheal tube) | |

53

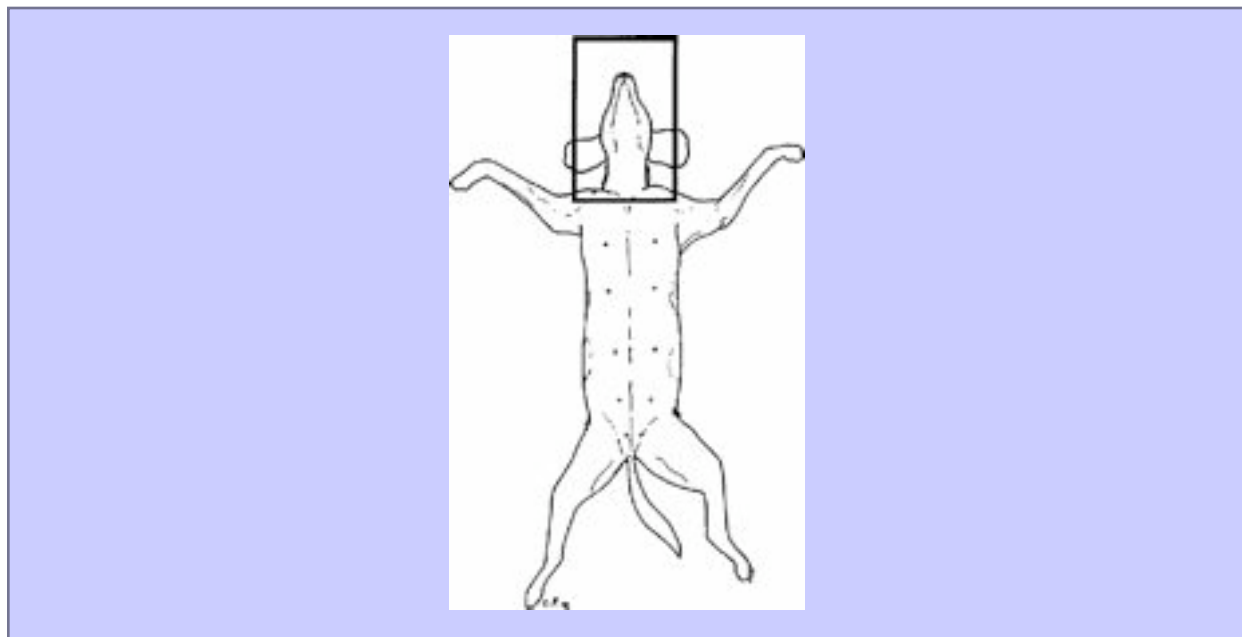
78 Ventral aspect of the deep structures of the neck of a dog. The ventral muscles have been resected to expose the trachea.



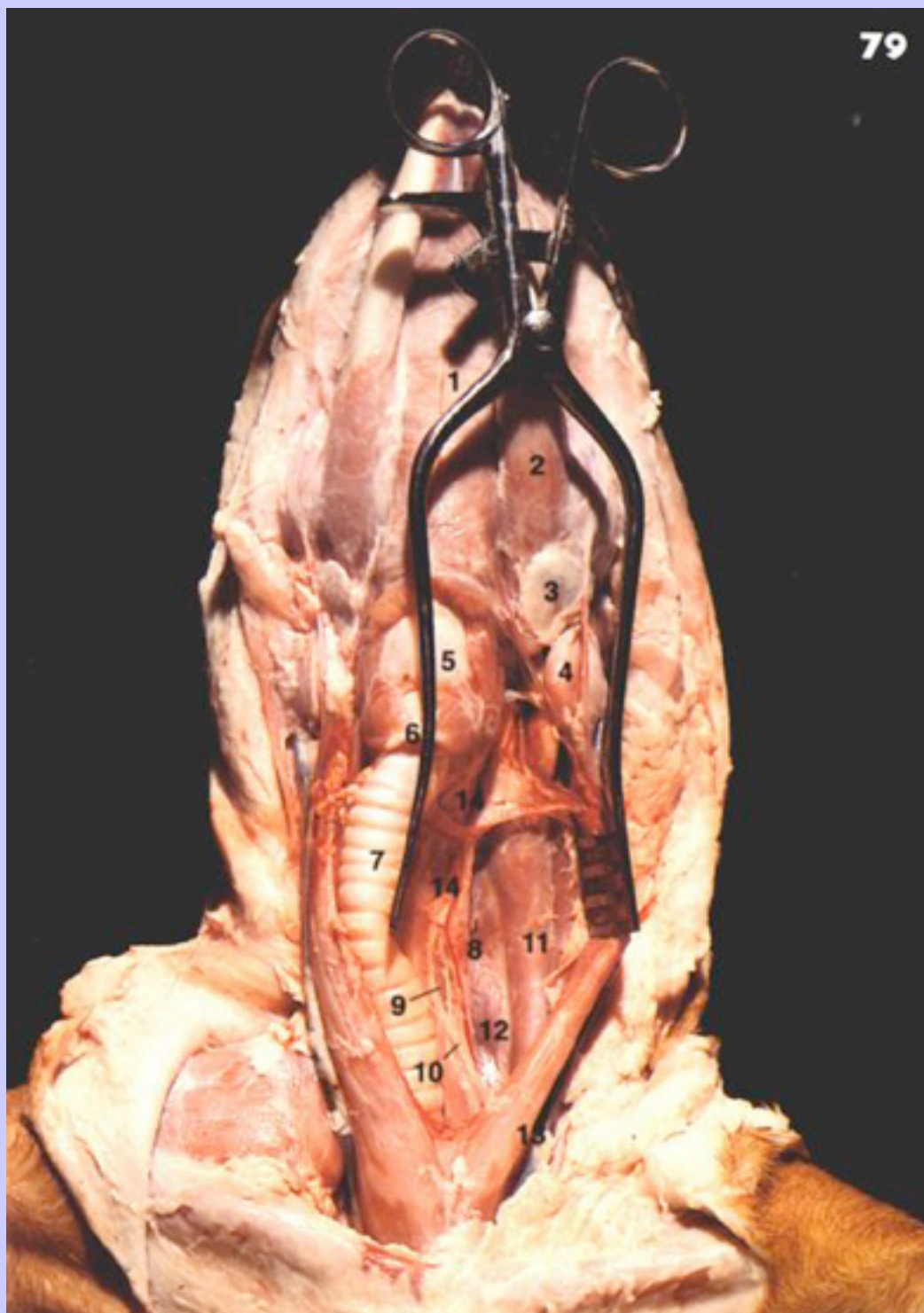
- 1 Mandibular symphysis
- 2 Mandibular body
- 3 M. mylohyoideus
- 4 M. digastricus
- 5 M. sternohyoideus (cut edge)
- 6 M. thyrohyoideus
- 7 M. cricothyroideus
- 8 Thyroid cartilage
- 9 Cricoid cartilage
- 10 Tracheal rings
- 11 Mandibular lymph nodes
- 12 Mandibular salivary gland
- 13 Lingual vein
- 14 Facial vein
- 15 Maxillary vein
- 16 Linguofacial vein
- 17 External jugular vein
- 18 M. sternothyrohyoideus
- 19 M. sternocephalicus
- 20 Carotid sheath with vagosympathetic trunk, carotid artery and internal jugular vein
- 21 Recurrent laryngeal nerve

2.0.10 Clinical Note

- 18** This view simulates the appearance of a midline ventral surgical approach to the cervical region. The median raphe between the Mm. sternothyrohyoideus is split and the muscles divided to reveal the deeper structures.



79 Ventral aspect of the deep structures of the neck of a dog. The trachea has been deviated from the midline to reveal the oesophagus and carotid sheath.



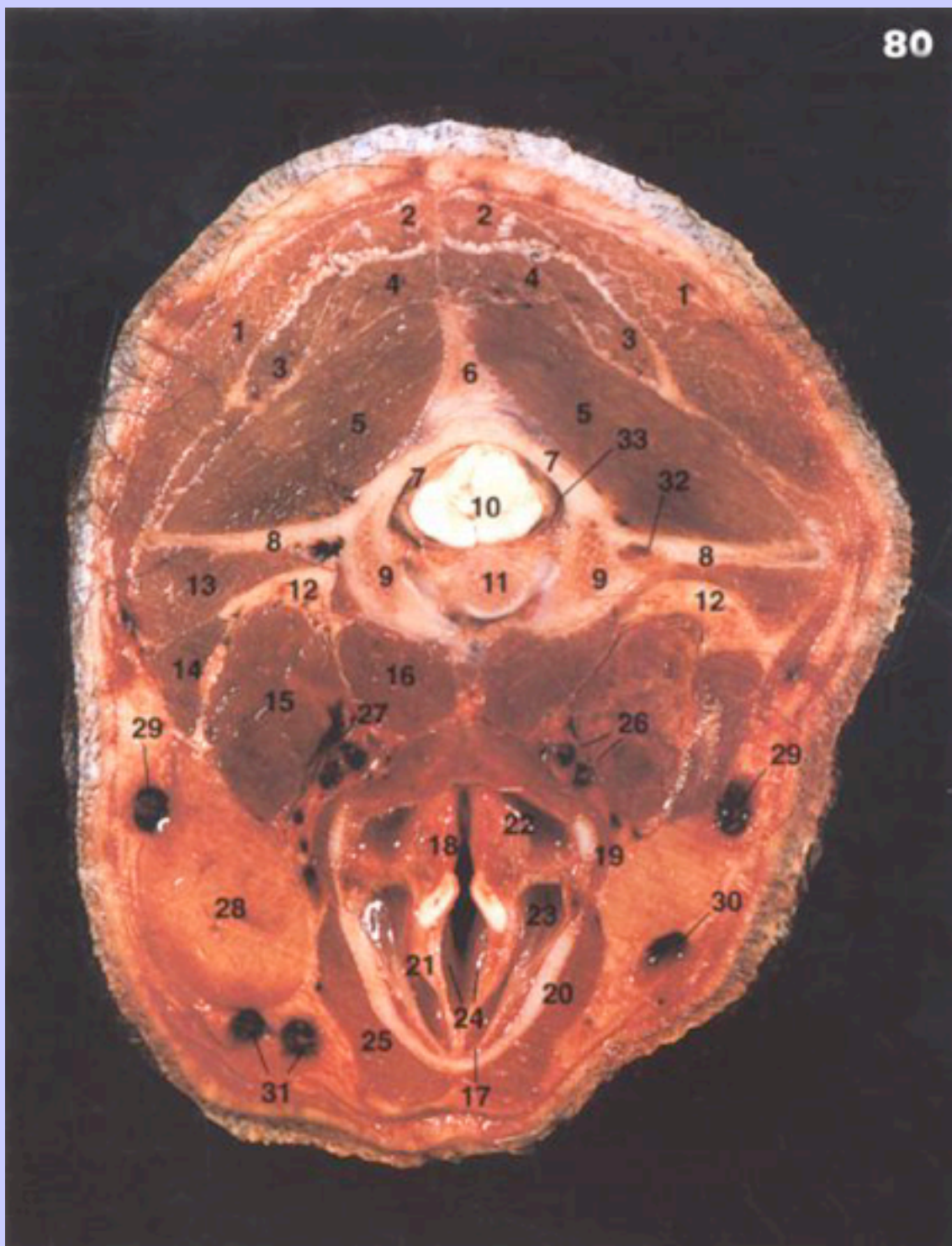
- 1 M. mylohyoideus
- 2 M. digastricus
- 3 Mandibular lymph node
- 4 Mandibular salivary gland
- 5 Thyroid cartilage
- 6 Cricoid cartilage
- 7 Trachea diverted to right
- 8 Carotid artery
- 9 Vagosympathetic trunk
- 10 Recurrent laryngeal nerve
- 11 Oesophagus
- 12 M. longus colli
- 13 M. sternocephalicus
- 14 Thyroid gland

2.0.11 Clinical Note

11 This view simulates the appearance of a midline ventral approach to the cervical region used for such purposes as oesophagotomy or cervical disc fenestration. Care must be taken when manipulating the oesophagus to identify and preserve the left recurrent laryngeal nerve (**10**) which lies between the oesophagus and the trachea on the left of the midline

54

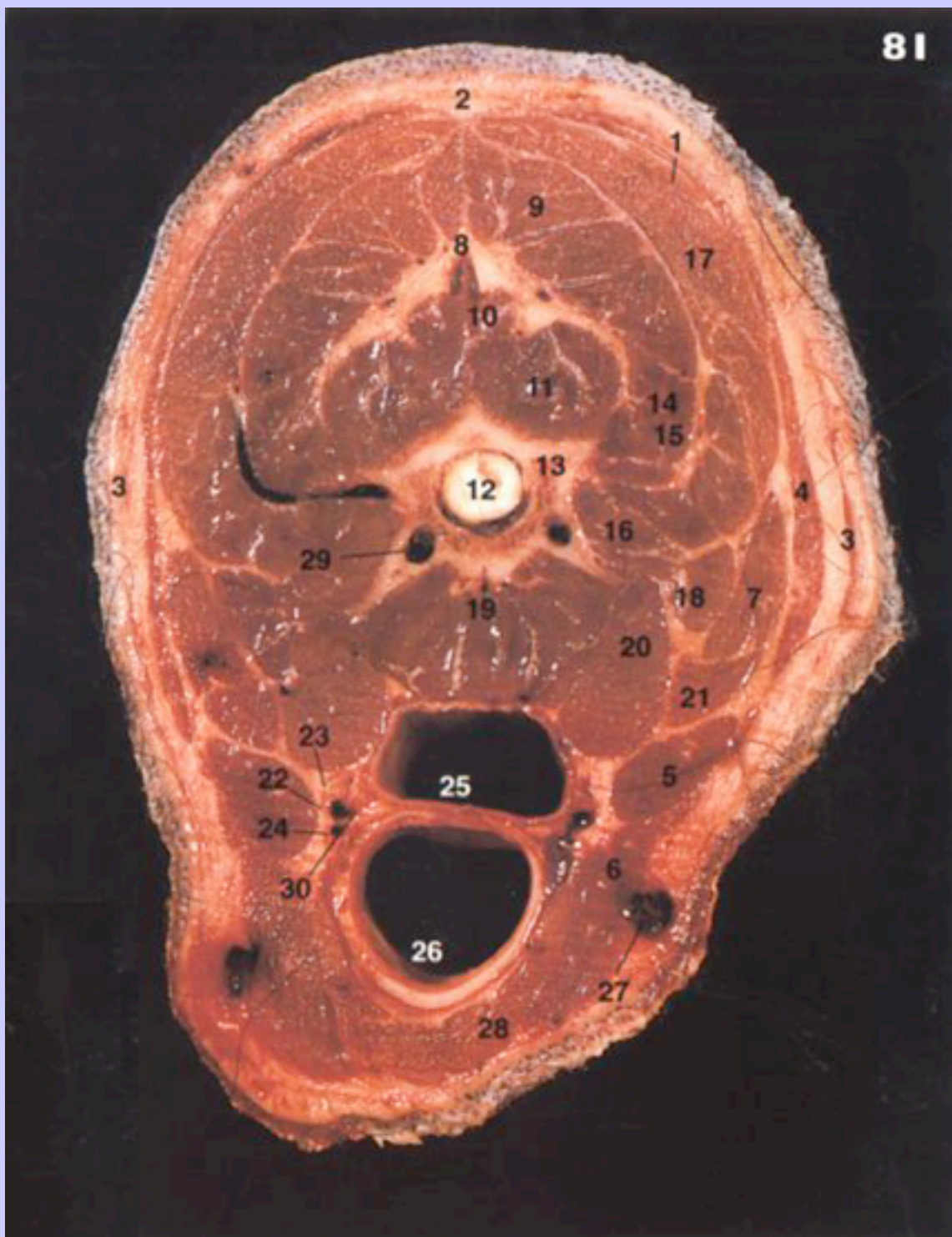
80 Cranial aspect of a transverse section through the neck of a dog at the level of the atlantoaxial joint.





- | | |
|---|--|
| 1 M. splenius capitis | 16 M. rectus capitis ventralis |
| 2 M. semispinalis capitis
(biventer) | 17 Larynx |
| 3 M. semispinalis capitis
(complexus) | 18 Arytenoid cartilages |
| 4 M. rectus capitis dorsalis
major | 19 Cricoid cartilage |
| 5 M. obliquus capitis caudalis | 20 Thyroid cartilage |
| 6 Spinous process of second
cervical vertebra (axis) | 21 Vocal folds |
| 7 Arch } of first cervical | 22 M. cricoarytenoideus dorsalis |
| 8 Wing } vertebra (atlas) | 23 Lateral ventricle |
| 9 Body } | 24 Rima glottis |
| 10 Spinal cord | 25 M. thyrohyoideus |
| 11 Dens (odontoid process) of
second cervical vertebra
(axis) | 26 Division of common carotid
artery into external and
internal carotid arteries |
| 12 Jugular process | 27 Vagosympathetic trunk |
| 13 Mm. intertransversarii cervicis | 28 Mandibular salivary gland |
| 14 M. omotransversarius | 29 Maxillary vein |
| 15 M. longus capitis | 30 Linguofacial vein |
| | 31 Linguofacial and facial veins
(divided) |
| | 32 Vertebral artery and vein |
| | 33 Internal vertebral plexus |

81 Cranial aspect of a transverse section through the neck of a dog at the level of the third cervical vertebra.



- 1 M. rhomboideus capitis
- 2 Dorsal median raphe
- 3 Mm. cutanei colli
- 4 M. brachiocephalicus (M. cleidocephalicus, pars cervicalis)
- 5 M. sternocephalicus, pars occipitalis, and M. cleidocephalicus, pars mastoidea
- 6 M. sternocephalicus, pars mastoidea
- 7 M. omotransversarius
- 8 Ligamentum nuchae
- 9 M. semispinalis capitis (biventer and complexus)
- 10 M. multifidus cervicis
- 11 M. spinalis cervicis
- 12 Spinal cord
- 13 Third cervical vertebra
- 14 Mm. longissimus capitis and atlantis
- 15 M. longissimus cervicis
- 16 Mm. intertransversarius dorsalis, medius and ventralis
- 17 M. splenius
- 18 M. serratus ventralis cervicis
- 19 M. longus colli
- 20 M. longus capitis
- 21 M. scalenus medius
- 22 Common carotid artery
- 23 Vagosympathetic trunk
- 24 Internal jugular vein
- 25 Oesophagus
- 26 Trachea

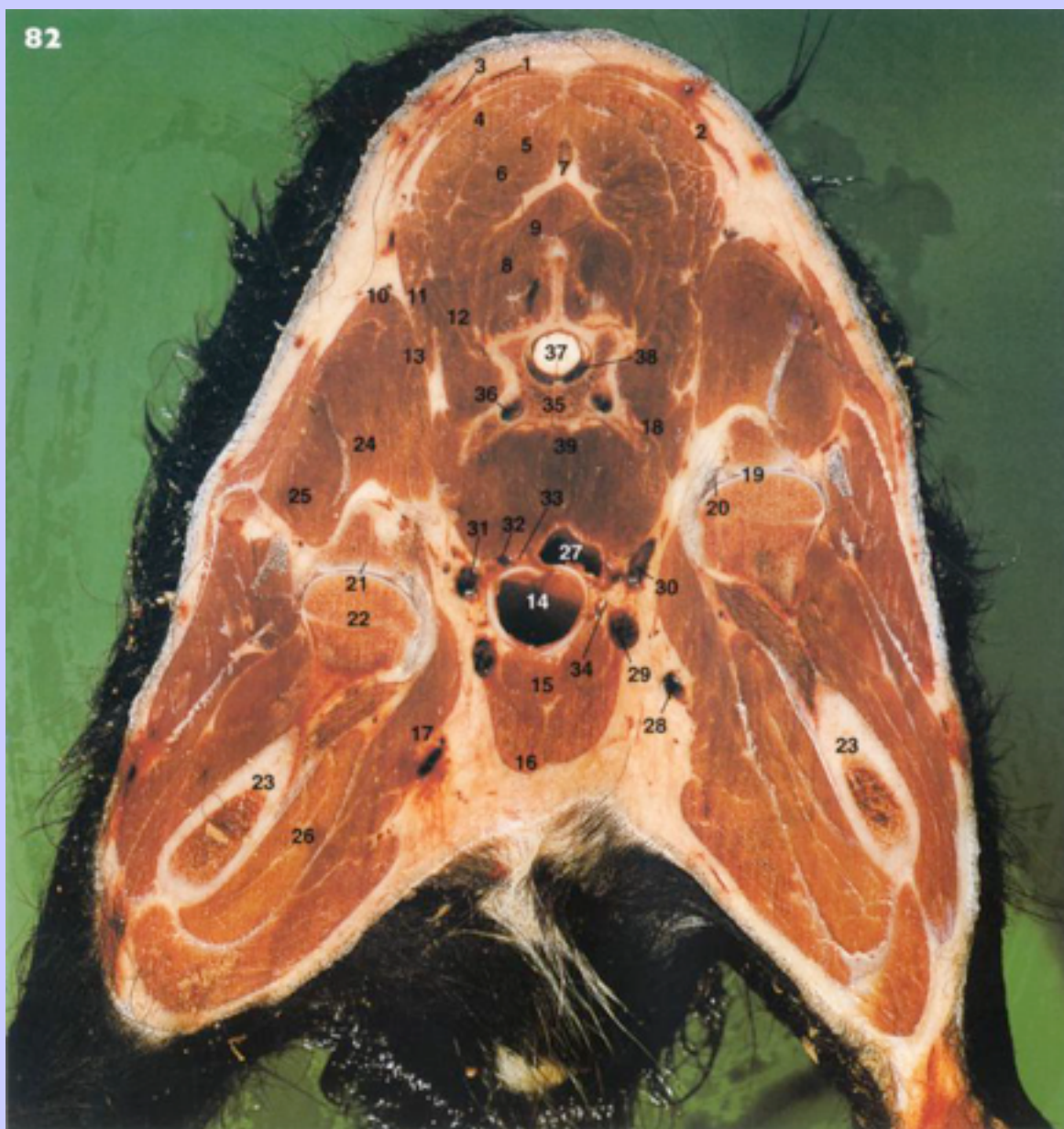
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- 27 External jugular vein
- 28 M. sternohyoideus and M. sternothyroideus
- 29 Vertebral artery and vein
- 30 Recurrent laryngeal nerve

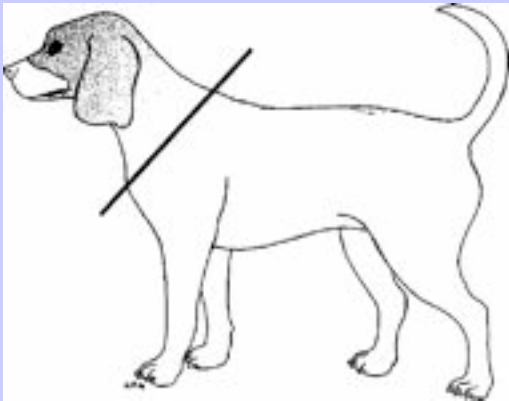
55

56

82 Cranial aspect of a transverse section through the neck of a dog at the level of the seventh cervical vertebra.



1 M. rhomboideus	14 Trachea	26 M. biceps brachii
2 Mm. cutanei colli	15 M. sternohyoidideus and	27 Oesophagus
3 M. trapezius	M. sternothyroideus	28 Cephalic vein
4 M. splenius	16 M. sternocephalicus	29 Jugular vein
5 M. biventer	17 M. brachiocephalicus	30 Superficial cervical vein
6 M. complexus	(M. cleidobrachialis)	31 Common carotid artery
7 Ligamentum nuchae	18 Mm. intertransversarii	32 Internal jugular vein
8 M. multifidus cervicis	19 Shoulder joint	33 Vagosympathetic trunk
9 M. spinalis cervicis	20 Joint capsule	34 Recurrent laryngeal nerve
10 M. serratus ventralis cervicis	21 Glenoid surface of scapula	35 Seventh cervical vertebra
11 M. longissimus cervicis	22 Head } of humerus	36 Vertebral artery and vein
12 Mm. longissimus capitis and	23 Body }	37 Spinal cord
atlantis	24 M. supraspinatus	38 Internal vertebral plexus
13 M. omotransversarius	25 M. infraspinatus	39 M. longus colli

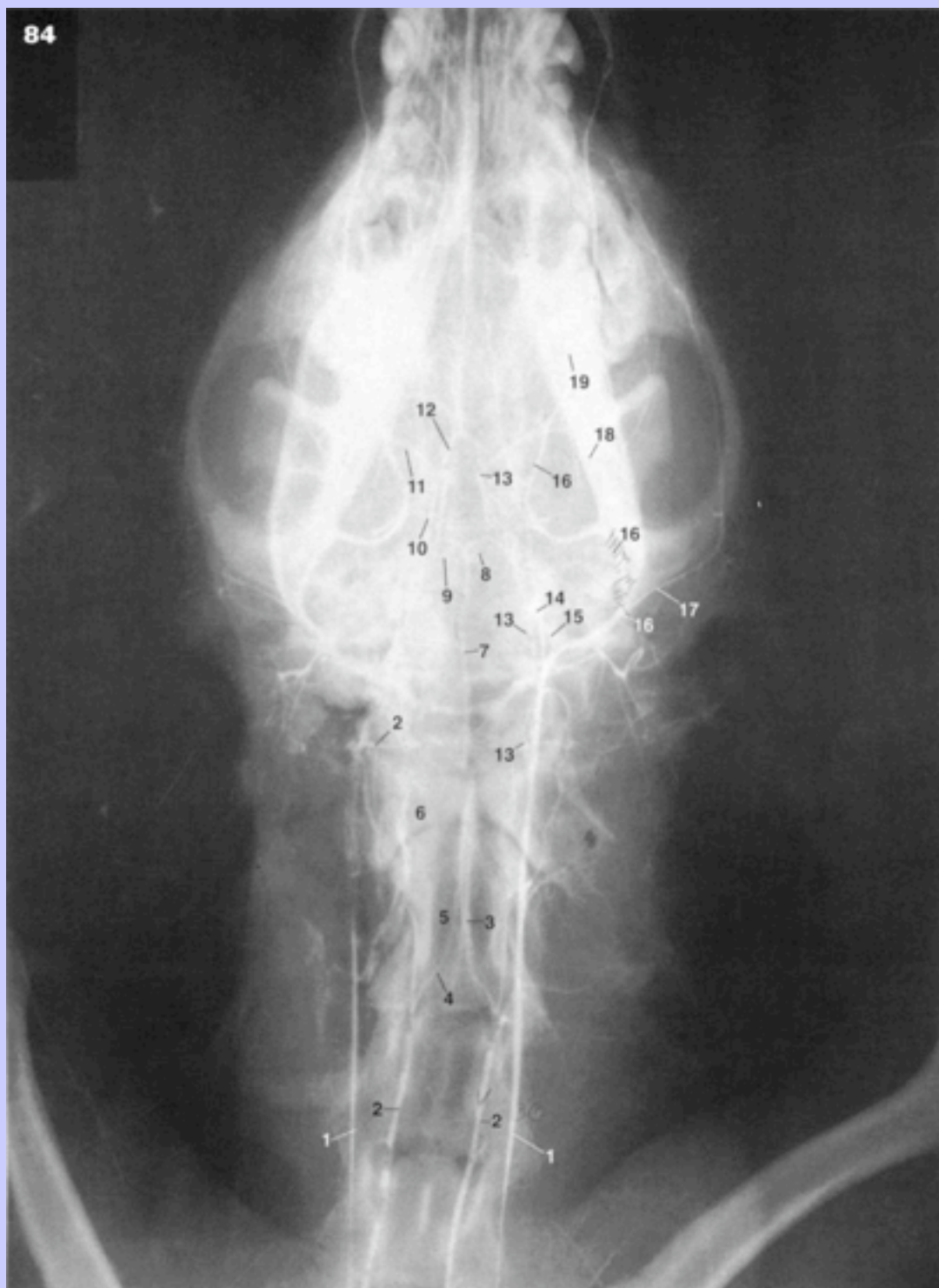


83 Lateral radiograph of an arteriogram of the major arterial vessels to the head and neck of a dog.



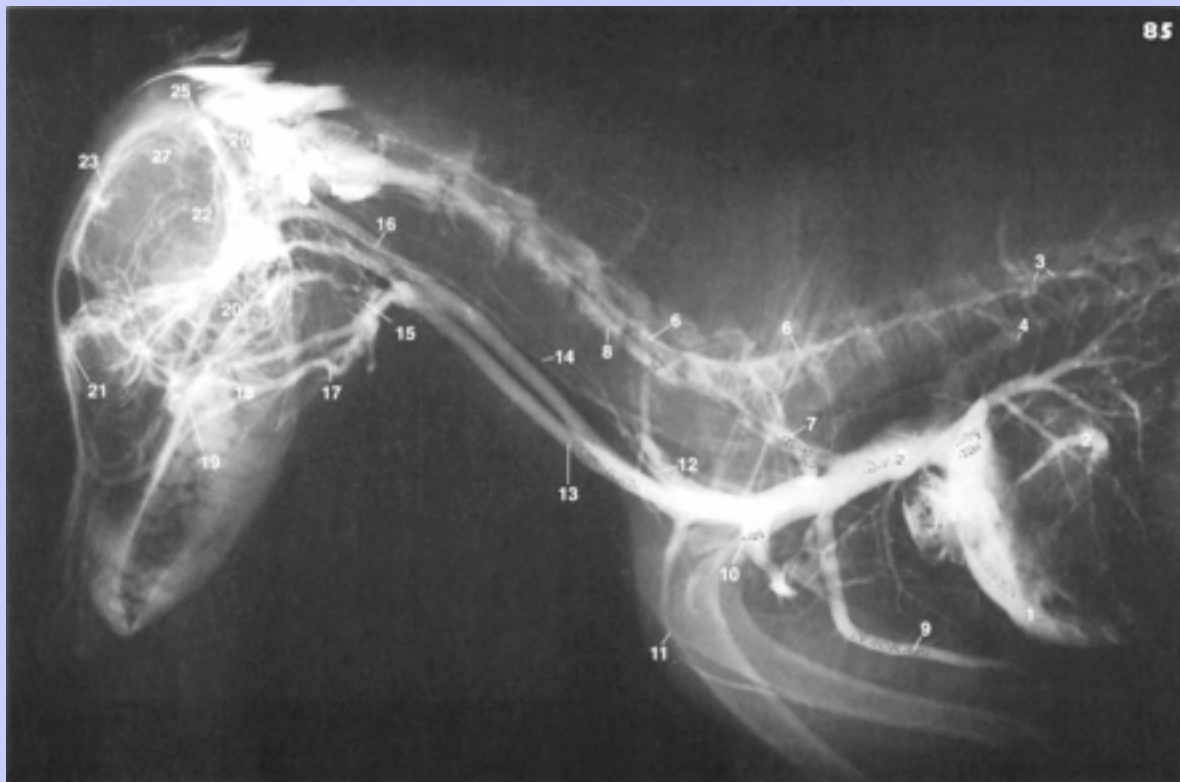
- 1 Left ventricular outflow tract
- 2 Aortic valve
- 3 Coronary artery
- 4 Ascending aorta
- 5 Aortic arch
- 6 Descending aorta
- 7 Segmental arteries
- 8 Coeliac artery
- 9 Cranial mesenteric artery
- 10 Brachiocephalic trunk
- 11 Right costocervical trunk
- 12 Right vertebral artery
- 13 Right common carotid artery
- 14 Right subclavian artery
- 15 Axillary artery
- 16 Internal thoracic artery
- 17 External thoracic artery
- 18 Left subclavian artery
- 19 Left vertebral artery
- 20 Left common carotid artery
- 21 Cranial laryngeal artery
- 22 Internal carotid artery
- 23 Lingual artery
- 24 Facial artery
- 25 Maxillary artery

84 Ventrodorsal radiograph of an arteriogram of the head of a dog, showing the arterial circle of the brain.



- 1 Common carotid artery
- 2 Vertebral artery
- 3 Ventral spinal artery
- 4 Spinal ramus
- 5 Second cervical vertebra (axis)
- 6 First cervical vertebra (atlas)
- 7 Basilar artery
- 8 Caudal communicating artery
- 9 Rostral cerebellar artery
- 10 Caudal cerebral artery
- 11 Middle cerebral artery
- 12 Rostral cerebral artery
- 13 Internal carotid artery
- 14 Lingual artery
- 15 Facial artery
- 16 Maxillary artery
- 17 Superficial temporal artery
- 18 Mandibular alveolar artery
- 19 Infraorbital artery

85 Lateral radiograph of a venogram of the head and neck of a dog.



- 1 Right ventricle
- 2 Coronary veins
- 3 Intercostal veins
- 4 Azygos vein
- 5 Cranial vena cava
- 6 Internal vertebral venous plexus
- 7 Costocervical vein
- 8 Vertebral vein
- 9 Internal thoracic vein
- 10 Axillary vein
- 11 Cephalic vein

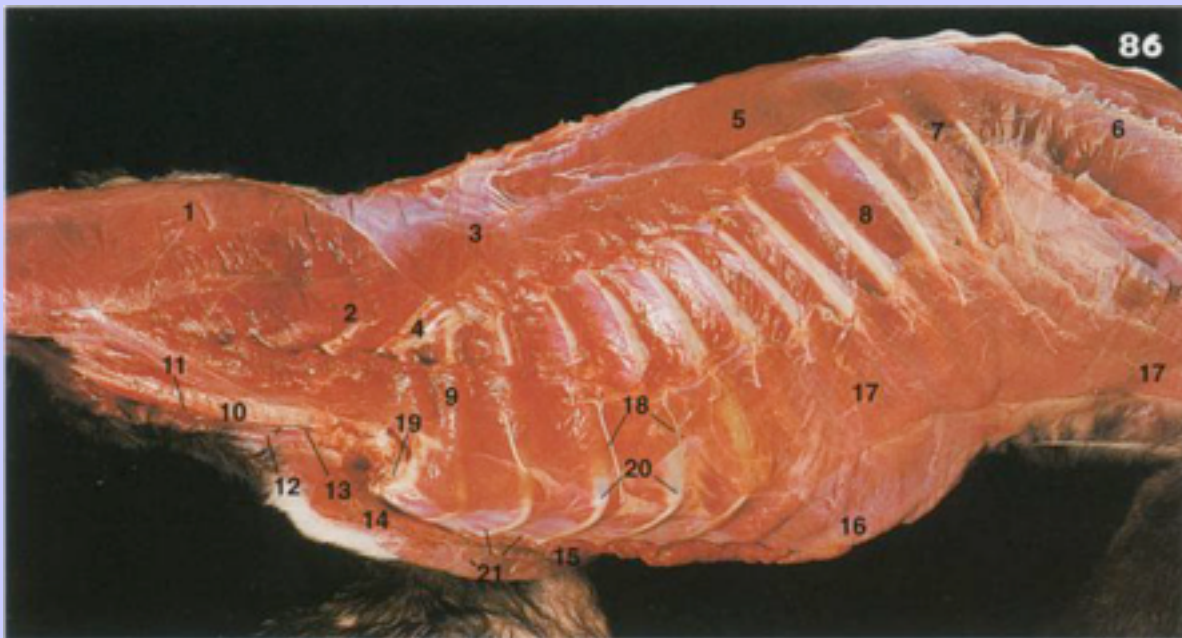
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- 12 Superficial cervical vein
- 13 External jugular vein
- 14 Internal jugular vein
- 15 Linguofacial vein
- 16 Maxillary vein
- 17 Lingual vein
- 18 Deep facial vein
- 19 Facial vein
- 20 Cavernous sinus
- 21 Angular vein of eye
- 22 Temporal sinus
- 23 Dorsal sagittal sinus
- 24 Straight sinus
- 25 Transverse sinus
- 26 Sigmoid sinus
- 27 Dorsal petrosal sinus

3 SPINAL COLUMN

Using bony specimens and radiographs, the osteology of the vertebral column is demonstrated in the other chapters of the book, where such detail is more relevant to the understanding of the anatomy of the respective regions. This short chapter is designed to illustrate the particular musculature surrounding the spinal column, together with the contents of the vertebral canal, by means of fresh dissected material.

86 Lateral aspect of the superficial epaxial muscles and the muscles of the thoracic cage of a dog. The left thoracic limb with its extrinsic muscles has been removed, as has the cutaneous trunci muscle.



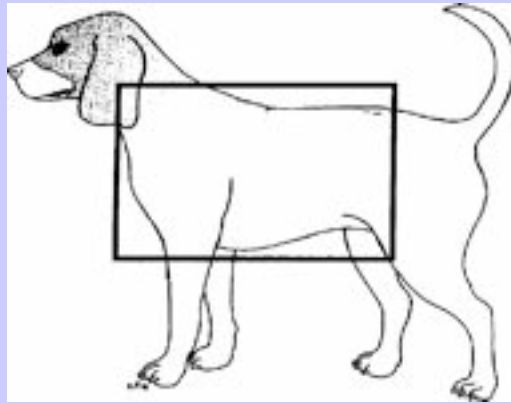
- 1 M. splenius cervicis
- 2 M. longissimus cervicis
- 3 M. serratus dorsalis cranialis
- 4 M. longissimus thoracis
- 5 M. spinalis and M. semispinalis thoracis
- 6 Mm. longissimus thoracis and lumborum
- 7 M. iliocostalis
- 8 Mm. intercostales

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- 9 M. scalenus
- 10 Trachea
- 11 M. sternothyroideus
- 12 M. sternocephalicus
- 13 External jugular vein
- 14 Mm. pectorales superficiales (cut)
- 15 M. pectoralis profundus (cut)
- 16 M. rectus abdominis
- 17 M. obliquus externus abdominis
- 18 Distal lateral cutaneous branches of intercostal nerves
- 19 Manubrium sterni
- 20 Costochondral joints
- 21 Sternocostal joints

87 Lateral aspect of the deep epaxial muscles of the trunk of a dog. The dorsal serratus cranialis muscle has been removed.





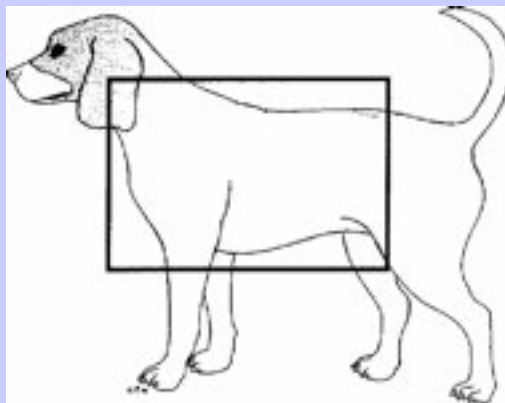
- 1 Lumbodorsal fascia (cut)
- 2 Mm. longissimus thoracis and lumborum
- 3 M. obliquus externus abdominis
- 4 M. obliquus internus abdominis
- 5 M. rectus abdominis
- 6 M. iliocostalis lumborum
- 7 M. iliocostalis thoracis
- 8 M. longissimus cervicis
- 9 M. spinalis capitis
- 10 M. semispinalis capitis
- 11 M. spinalis and M. semispinalis thoracis

88 Lateral aspect of the deep epaxial muscles of the neck and thoracic region of a dog. The splenius cervicis and dorsal serratus cranialis muscles have been removed.



- 1 M. longissimus capitis
- 2 M. longissimus cervicis
- 3 Mm. longissimus thoracis and lumborum
- 4 M. iliocostalis thoracis
- 5 M. spinalis and M. semispinalis thoracis
- 6 M. semispinalis capitis (biventer)
- 7 M. semispinalis capitis (complexus)

89 Lateral aspect of the deeper layer of the epaxial muscles of the neck and thorax of a dog. The semispinalis capitis and thoracis muscles have been removed to expose the ligamentum nuchae.



- 1 Ligamentum nuchae
- 2 M. spinalis cervicis
- 3 M. multifidus cervicis
- 4 M. multifidus thoracis

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5 M. iliocostalis thoradis

6 Mm. interspinales

7 Supraspinous ligament

62

63

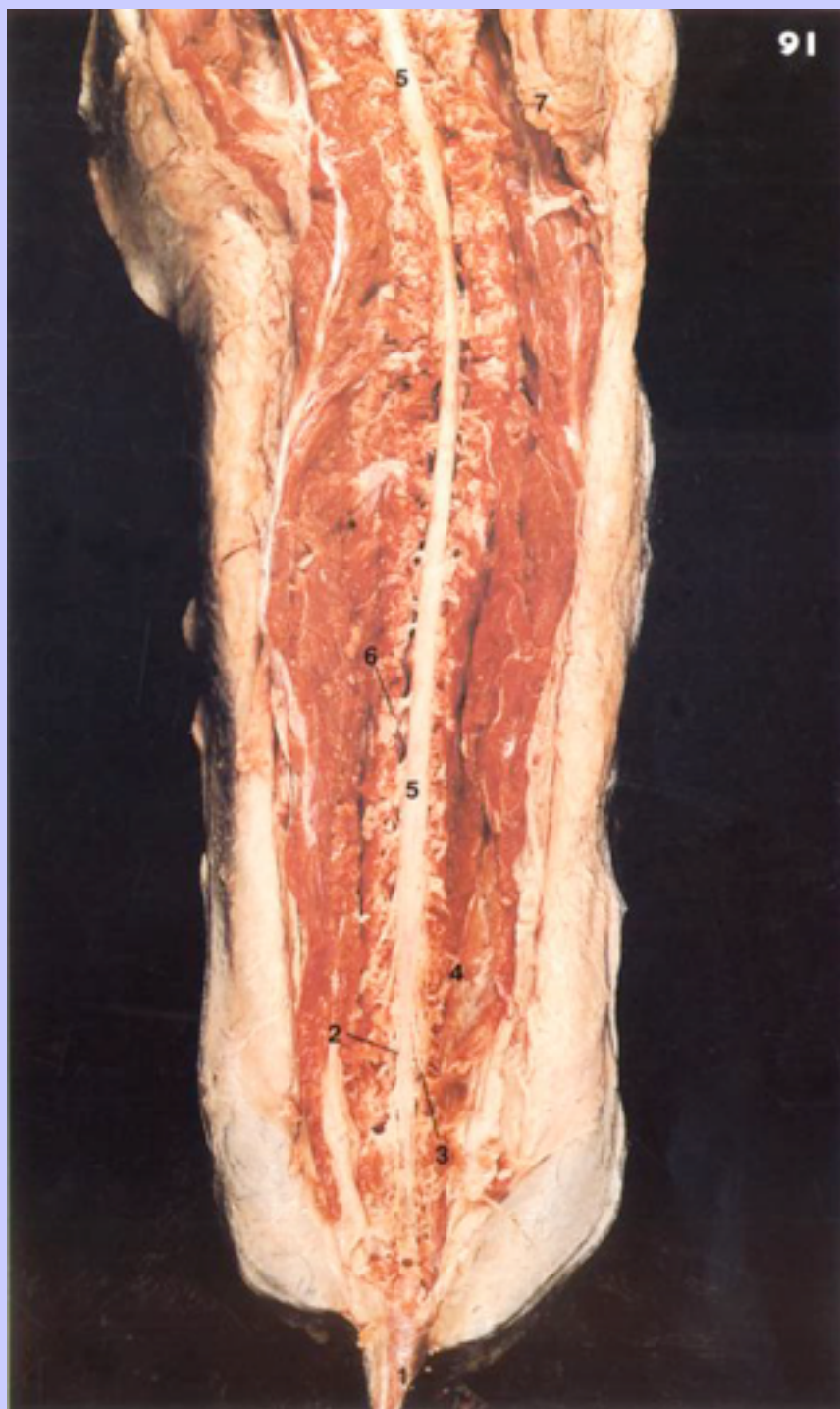
90 Dorsal aspect of the brain and spinal cord of a dog, to the level of the thoracolumbar junction. The dorsal epaxial muscles, the dorsal vertebral laminae, and the roof of the cranium have been removed to reveal the meningeal layers covering the brain and spinal cord.



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- 1 Dura mater covering spinal cord
- 2 Vertebral canal
- 3 Pectoral limb
- 4 First cervical vertebra (atlas)
- 5 Cerebellum
- 6 Transverse sinus overlying transverse fissure
- 7 Cerebral hemispheres
- 8 Sagittal sinus overlying longitudinal fissure
- 9 Olfactory bulbs
- 10 Frontal sinus

91 Dorsal aspect of the spinal cord of a dog, from the level of the first thoracic vertebra. The dorsal epaxial muscles and the dorsal vertebral laminae have been removed to reveal the vertebral canal.



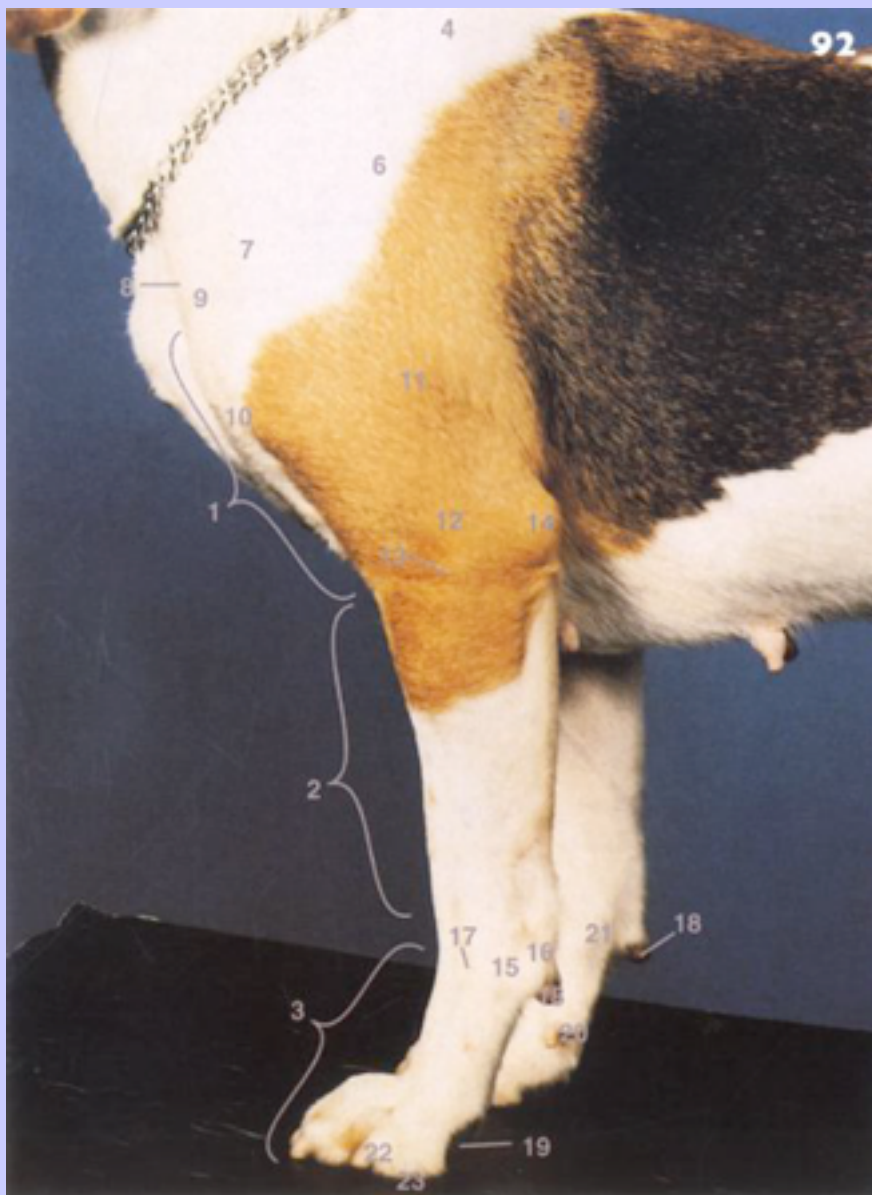
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- 1 Tali
- 2 Cauda equina
- 3 Caudal spinal nerves
- 4 Sacrum
- 5 Dura mater covering spinal cord
- 6 Spinal nerve
- 7 Pectoral limb

4 THORACIC LIMB

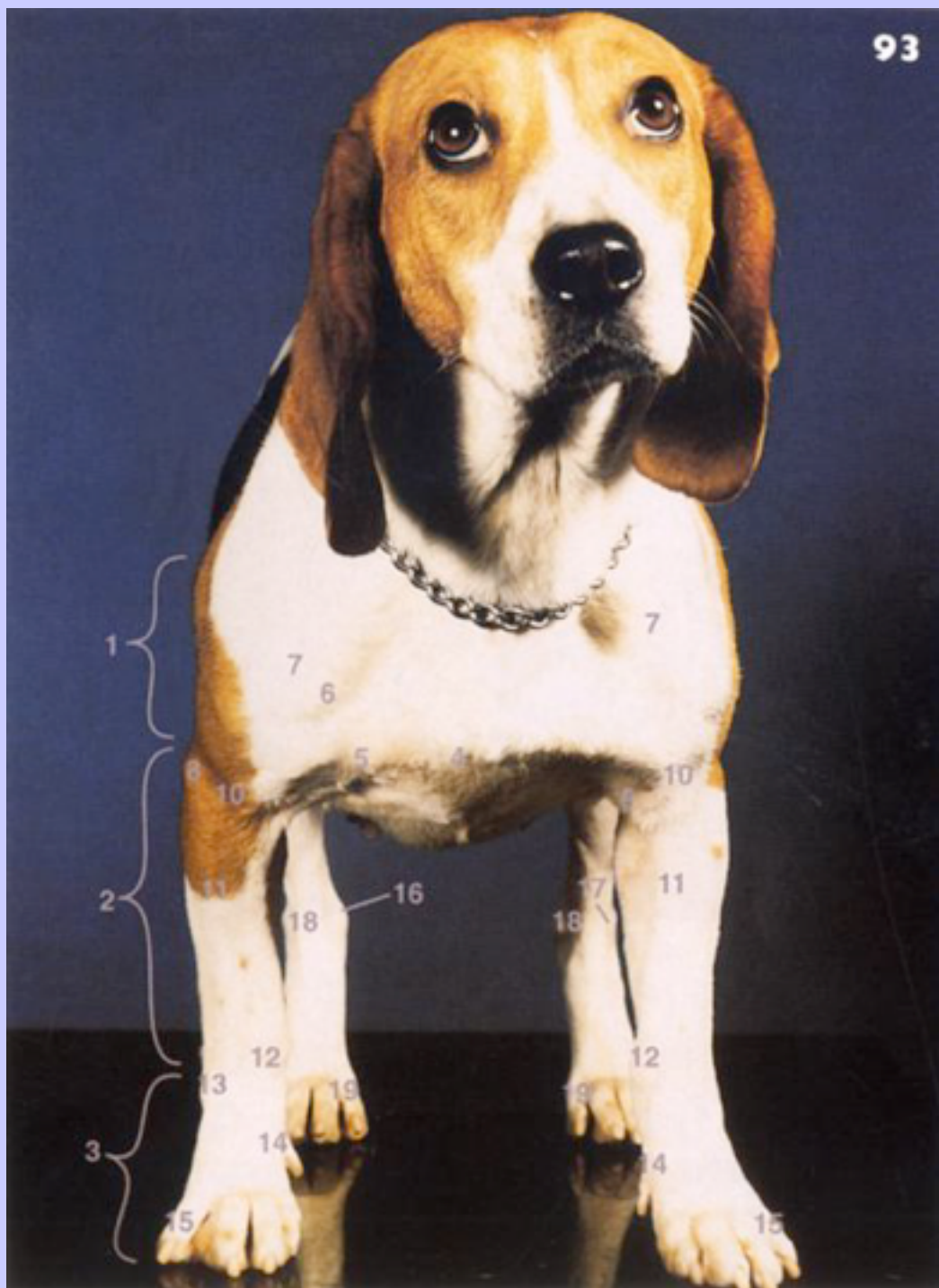
Beginning with the proximal structures and descending distally to the manus, the osteology and myology of the thoracic limb are displayed. The osteological details are revealed first, using bony specimens (both singly and in an articulated form) and radiographs, and the muscular attachments are then illustrated, followed by prepared dissections. Blood vessels and nerves are named as they occur in the dissections, and a contrast medium is used with radiography to explain the course of the vascular supply.

92 Lateral aspect of the left thoracic limb of a standing live dog, demonstrating palpable landmarks commonly used in clinical examination.



- | | |
|----------------------------------|--------------------------------|
| 1 Brachium | 13 Elbow joint (cubital joint) |
| 2 Antebrachium | 14 Olecranon process |
| 3 Manus | 15 Styloid process |
| 4 Cranial angle | } of ulna |
| 5 Caudal angle | |
| } of scapula | |
| 6 Spine | 16 Accessory carpal bone |
| 7 Acromion | 17 Carpal joint |
| 8 Shoulder joint | 18 Carpal pad |
| 9 Greater tubercle of humerus | 19 Metacarpal pad |
| 10 Deltoid tuberosity | 20 First digit (dew claw) |
| 11 M. triceps brachii | 21 Styloid process of radius |
| 12 Lateral epicondyle of humerus | 22 Fifth digit |
| | 23 Digital pad |

93 Cranial aspect of the thoracic limbs of a standing live dog, demonstrating palpable landmarks. The dorsal aspect of the pes of the pelvic limb is also displayed.

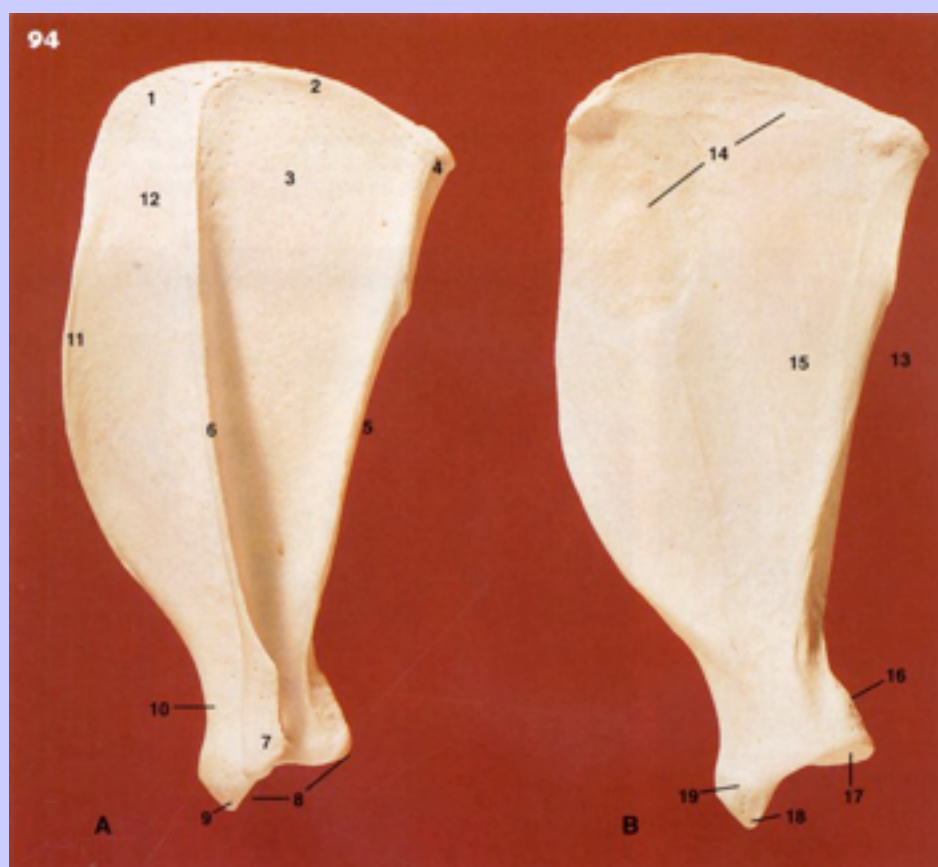



- | | |
|-------------------------------|---|
| 1 Brachium | 11 Cephalic vein (in subcutaneous position) |
| 2 Antebrachium | 12 Styloid process of radius |
| 3 Manus | 13 Styloid process of ulna |
| 4 Manubrium sterni | 14 First digit |
| 5 Pectoral muscle mass | 15 Fifth digit |
| 6 M. brachiocephalicus | 16 Medial malleolus of tibia |
| 7 Shoulder joint | 17 Lateral malleolus of fibula |
| 8 Lateral epicondyle } of | 18 Tarsal joint (hock) |
| 9 Medial epicondyle } humerus | 19 Second digit |
| 10 Elbow joint | |

65

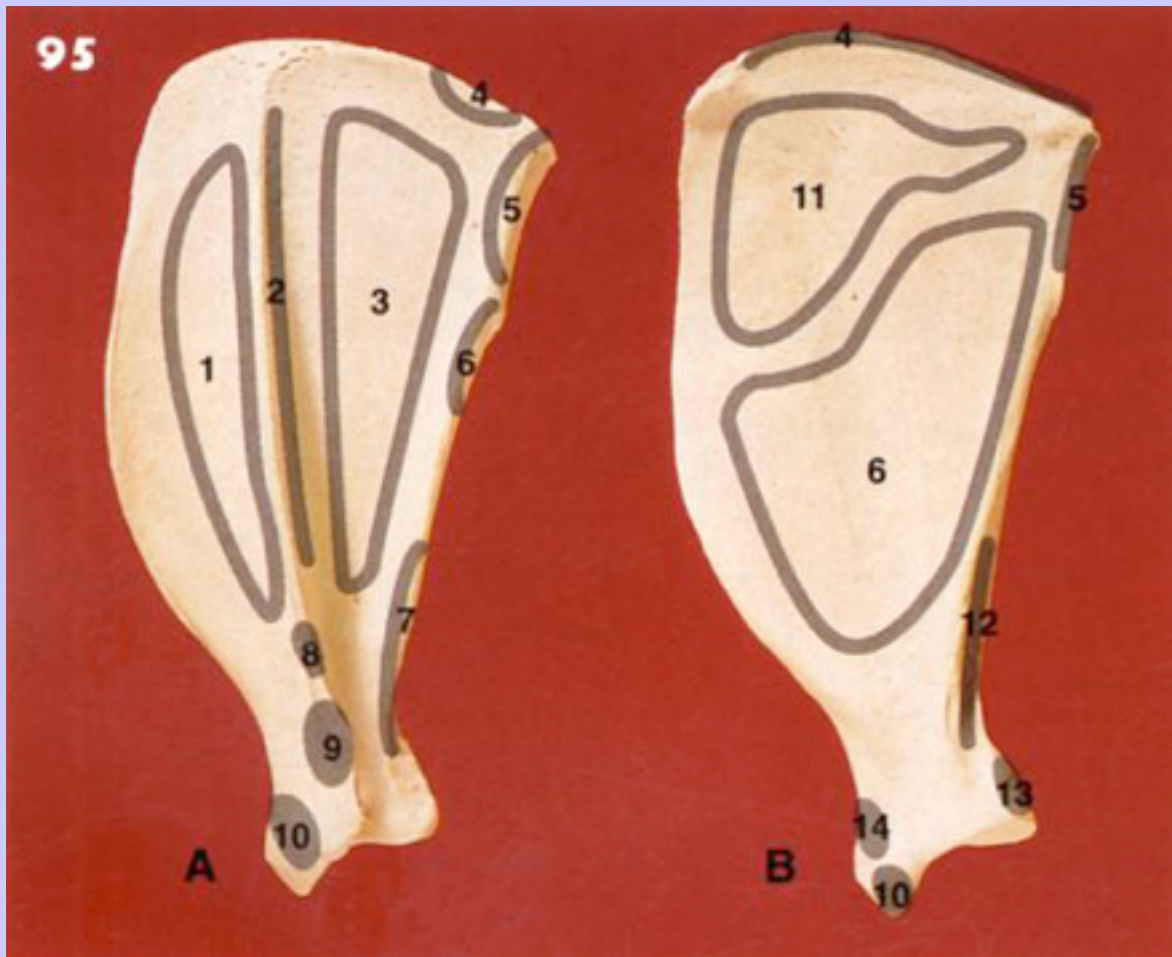
94 Lateral aspect of the left scapula (A) and medial aspect of the right scapula (B) of a dog.

66



- 
- 1 Cranial angle
 - 2 Dorsal border
 - 3 Infraspinous fossa
 - 4 Caudal angle
 - 5 Caudal border
 - 6 Spine
 - 7 Acromion
 - 8 Ventral angle
 - 9 Supraglenoid tubercle
 - 10 Scapular notch
 - 11 Cranial border
 - 12 Supraspinous fossa
 - 13 Caudal border
 - 14 Facies serrata
 - 15 Subscapular fossa
 - 16 Infraglenoid tubercle
 - 17 Glenoid cavity
 - 18 Supraglenoid tubercle
 - 19 Coracoid process

95 Lateral (A) and medial (B) aspect of the scapula of a dog, showing areas of muscle attachment.



- 1 Supraspinatus
- 2 Trapezius and deltoideus
- 3 Infraspinatus
- 4 Rhomboideus
- 5 Teres major
- 6 Subscapularis
- 7 Teres minor and long head of triceps

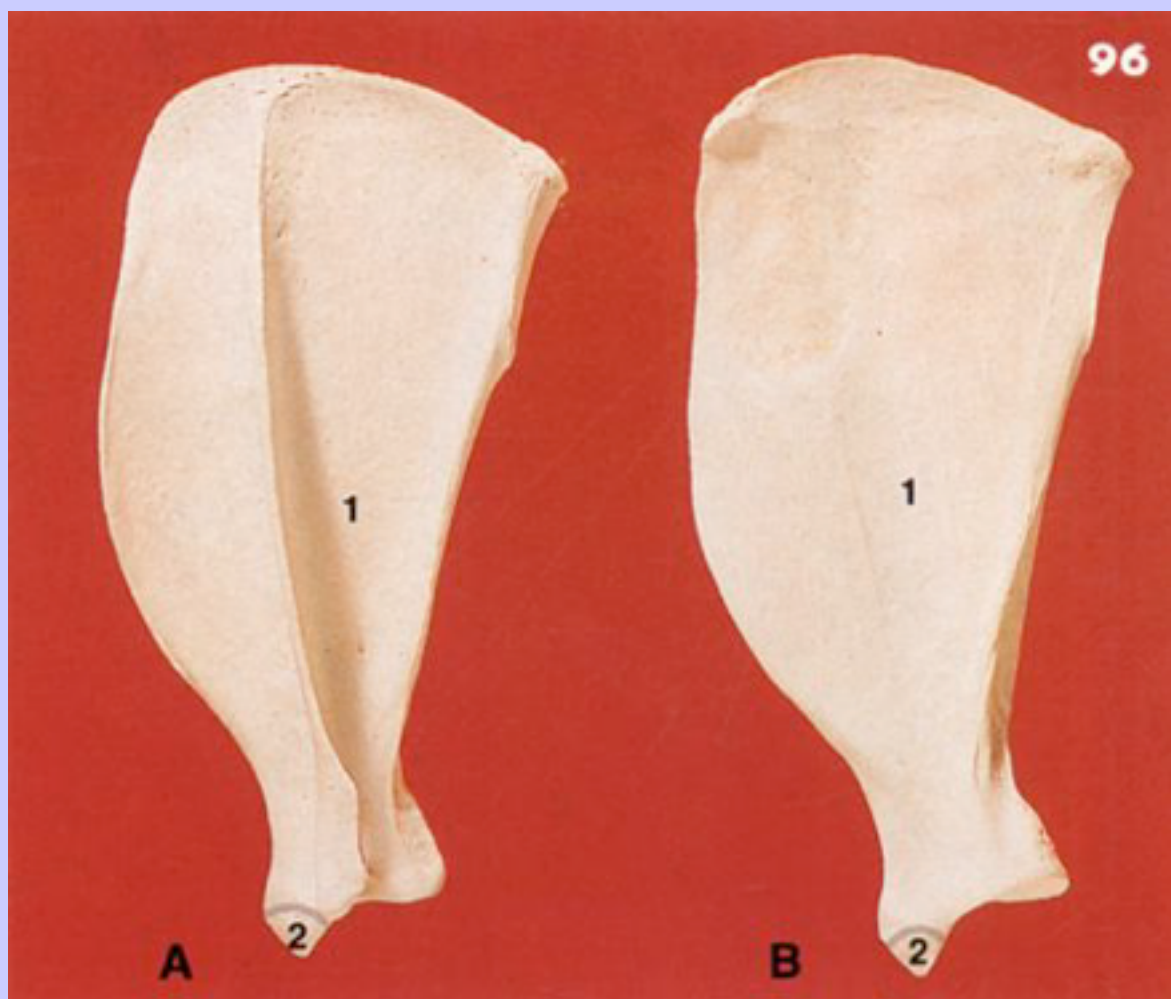
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- 8 Omotransversarius
- 9 Deltoideus
- 10 Biceps brachii
- 11 Serratus ventralis
- 12 Long head of triceps
- 13 Teres minor
- 14 Coracobrachialis

66

67

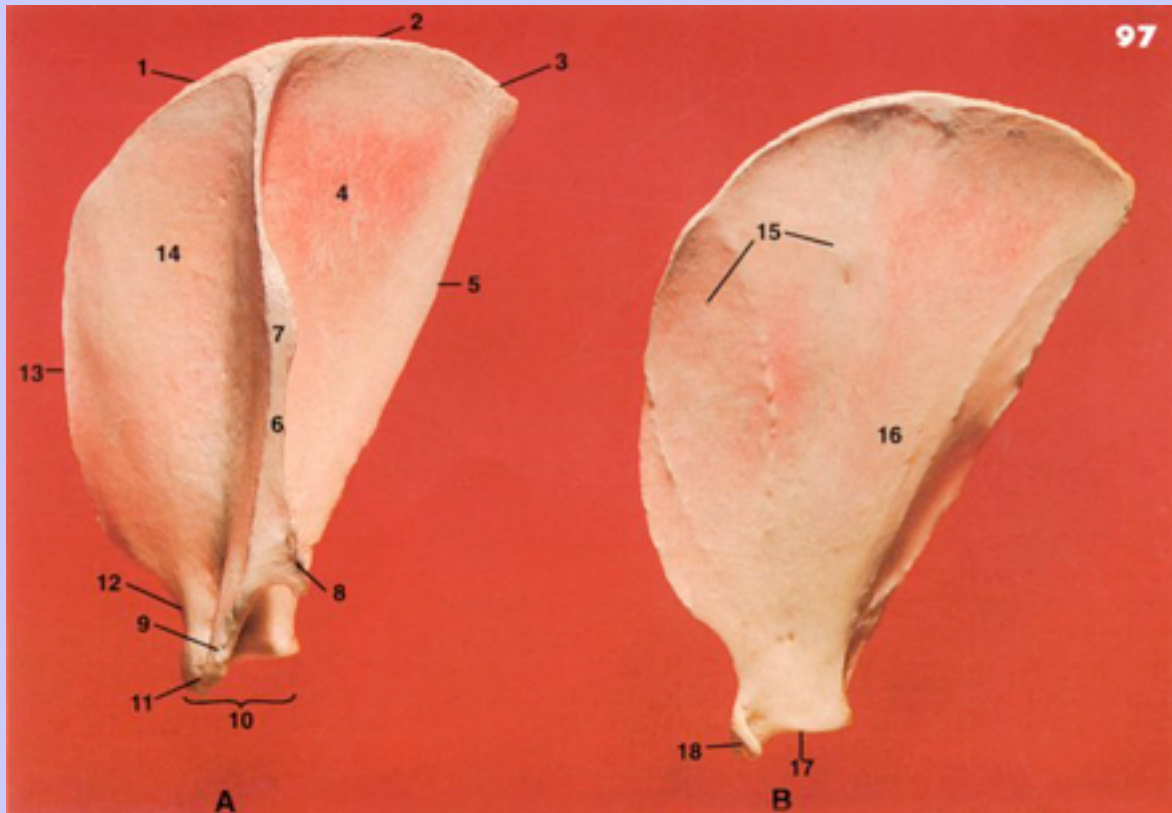
96 Lateral (A) and medial (B) aspect of the scapula of a dog, showing the centres of ossification.



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- 1 Body
- 2 Supraglenoid tubercle

97 Lateral aspect of the left scapula (A) and medial aspect of the right scapula (B) of a cat.




- | | | | |
|-----------------------|--------------------------|---------------|-----------------------|
| 1 Cranial angle | 8 Suprahamate process | } of acromion | 14 Supraspinous fossa |
| 2 Dorsal border | 9 Hamate process | | 15 Facies serrata |
| 3 Caudal angle | 10 Ventral angle | | 16 Subscapular fossa |
| 4 Infraspinous fossa | 11 Supraglenoid tubercle | | 17 Glenoid cavity |
| 5 Caudal border | 12 Scapular notch | | 18 Coracoid process |
| 6 Spine | | | |
| 7 Tuberosity of spine | 13 Cranial border | | |

67

98 Lateral aspect of the left humerus (A) and medial aspect of the right humerus (B) of a dog.



- 
- 1 Greater tubercle
 - 2 Crest of 1
 - 3 Head
 - 4 Neck
 - 5 Tricipital line (anconeal crest)
 - 6 Deltoid tuberosity
 - 7 Brachial groove (musculospiral groove)
 - 8 Body
 - 9 Condyle
 - 10 Radial fossa
 - 11 Supratrochlear foramen
 - 12 Lateral epicondylar crest
 - 13 Lateral epicondyle
 - 14 Olecranon fossa
 - 15 Head
 - 16 Lesser tubercle
 - 17 Crest of 16
 - 18 Tuberosity for teres major
 - 19 Intertubercular groove
 - 20 Medial epicondyle
 - 21 Condyle

99 Lateral (A) and medial (B) aspect of the humerus of a dog, showing areas of muscle attachment.



- 1 Supraspinatus
- 2 Infraspinatus
- 3 Teres minor

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- 4 Accessory head of triceps
- 5 Brachialis
- 6 Lateral head of triceps
- 7 Pectoralis superficialis
- 8 Deltoideus
- 9 Cleidobrachialis
- 10 Brachioradialis
- 11 Extensor carpi radialis
- 12 Anconeus
- 13 Extensors of carpus and digits, and ulnaris lateralis
- 14 Supinator
- 15 Supraspinatus
- 16 Pectoralis profundus
- 17 Subscapularis
- 18 Coracobrachialis and medial head of triceps
- 19 Pronator teres
- 20 Flexors of carpus and digits
- 21 Teres major and latissimus dorsi

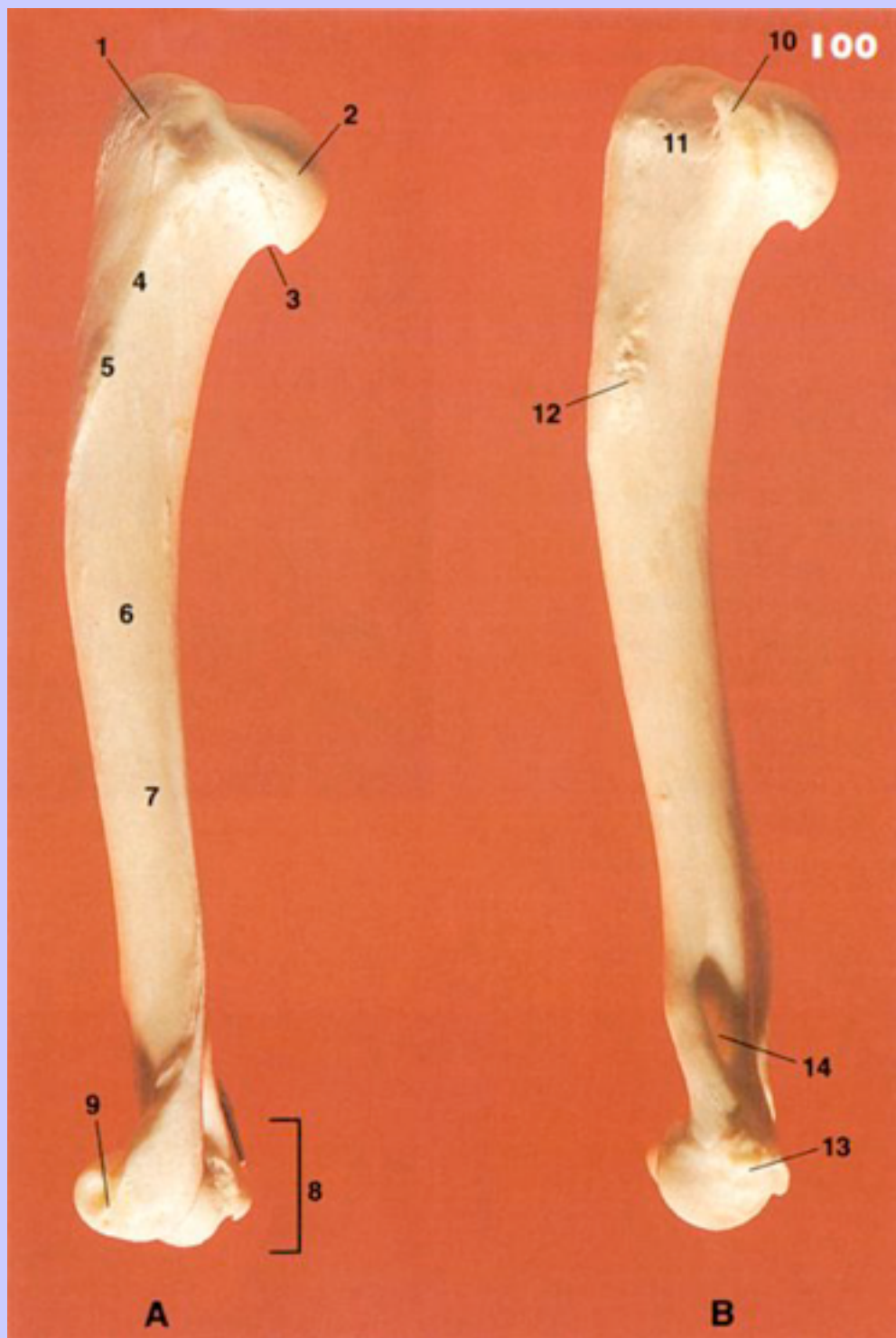
4.0.1

Clinical Note

- 8 Note that the body of the humerus is somewhat S-shaped in its contour and this presents problems with selecting an intramedullary pin to repair fractures of the shaft. An intramedullary pin is normally chosen so that it fills the diameter of the medullary cavity as fully as possible. However due to the S-shape of the humeral body or shaft a pin of a narrower calibre must be used in order that it can traverse down the curved medullary cavity. Fractures of the body tend to be distal in position due to the massive thickness of the bone proximally and the relative thinning distally, with the presence of the supratrochlear foramen and distal growth plate in young animals.

68

100 Lateral aspect of the left humerus (A) and medial aspect of the right humerus (B) of a cat.



- 1 Greater tubercle
- 2 Head
- 3 Neck
- 4 Tricipital line
- 5 Deltoid tuberosity
- 6 Body
- 7 Brachial groove
- 8 Condyle
- 9 Lateral epicondyle
- 10 Lesser tubercle
- 11 Intertubercular groove
- 12 Tuberosity for M. teres major
- 13 Medial epicondyle
- 14 Supracondylar foramen

4.0.2


Clinical Note

[Fig. 100](#), **14** The presence of the supracondylar foramen is a useful differential indicator when comparing the humerus of cat and dog. In life the brachial artery and median nerve pass through it so that a fracture at this point can have serious repercussions for the cat.

[Fig. 101](#), **14** In some of the smaller short-leg breeds, e.g. Cairn terriers, a patent foramen may be missing. In life, no structures pass through the dog's foramen, which is bridged over by connective tissue.

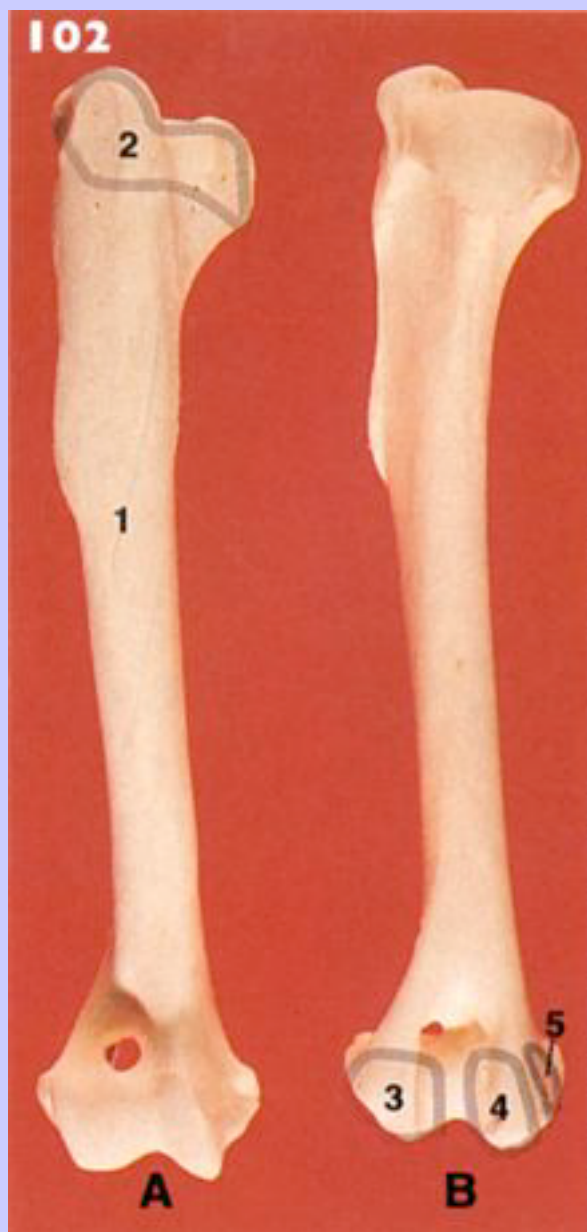
101 Caudal aspect of the right humerus (A) and cranial aspect of the left humerus (B) of a dog.



- 
- 1 Greater tubercle
 - 2 Lesser tubercle
 - 3 Intertubercular groove
 - 4 Crest of greater tubercle
 - 5 Tuberosity for M. teres minor
 - 6 Tricipital line
 - 7 Tuberosity for M. teres major
 - 8 Deltoid tuberosity
 - 9 Body
 - 10 Brachial groove
 - 11 Condyle
 - 12 Lateral epicondylar crest
 - 13 Radial fossa
 - 14 Supratrochlear foramen
 - 15 Lateral epicondyle
 - 16 Capitulum
 - 17 Trochlea
 - 18 Medial epicondyle
 - 19 Head
 - 20 Olecranon fossa

69

102 Cranial aspect of the right humerus (A) and caudal aspect of the left humerus (B) of a dog, showing the centres of ossification.



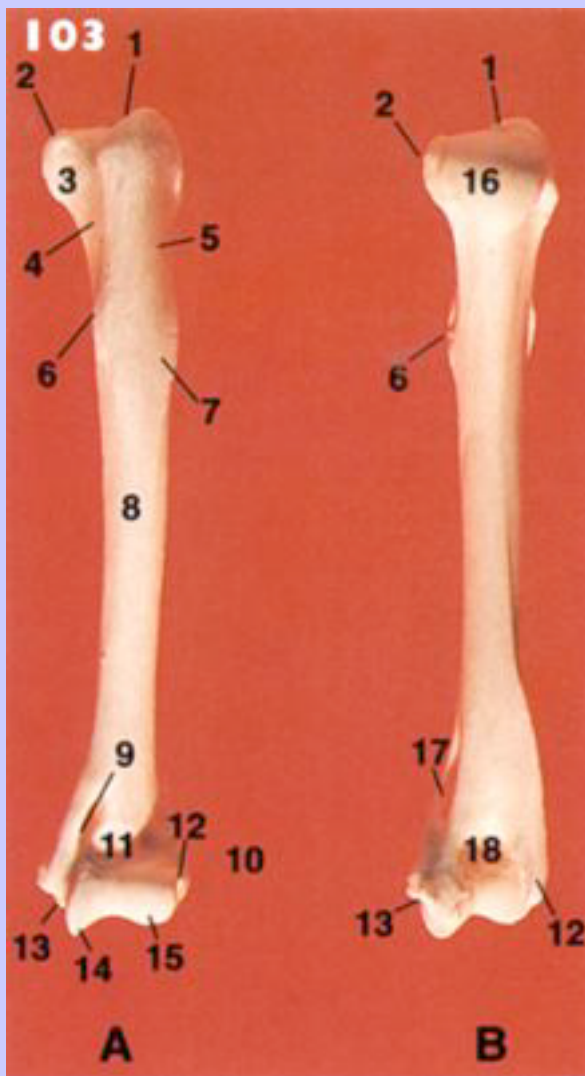
- 1 Body
- 2 Proximal
- 3 Lateral condyle

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4 Medial condyle

5 Medial epicondyle

103 Cranial aspect of the left humerus (A) and caudal aspect of the right humerus (B) of a cat.



1 Greater tubercle

2 Lesser tubercle

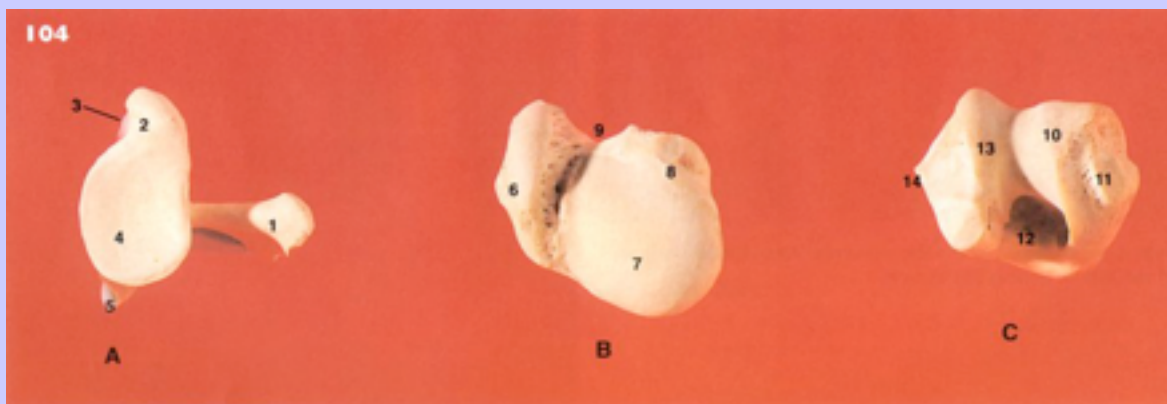
3 Intertubercular groove

4 Crest of greater tubercle

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- 5 Tricipital line
- 6 Tuberosity for M. teres major
- 7 Deltoid tuberosity
- 8 Body
- 9 Supracondylar foramen
- 10 Condyle
- 11 Radial fossa
- 12 Lateral epicondyle
- 13 Medial epicondyle
- 14 Trochlea
- 15 Capitulum
- 16 Head
- 17 Supracondylar foremen
- 18 Olecranon fossa

104 Distal extremity of the scapula (A), and proximal (B) and distal (C) extremities of the humerus of a dog.



- 1 Acromion process
- 2 Supraglenoid tubercle

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- 3 Coracoid process
- 4 Glenoid cavity
- 5 Infraglenoid tubercle
- 6 Greater tubercle
- 7 Head
- 8 Lesser tubercle
- 9 Intertubercular groove
- 10 Capitulum
- 11 Lateral epicondyle
- 12 Olecranon fossa
- 13 Trochlea
- 14 Medial epicondyle

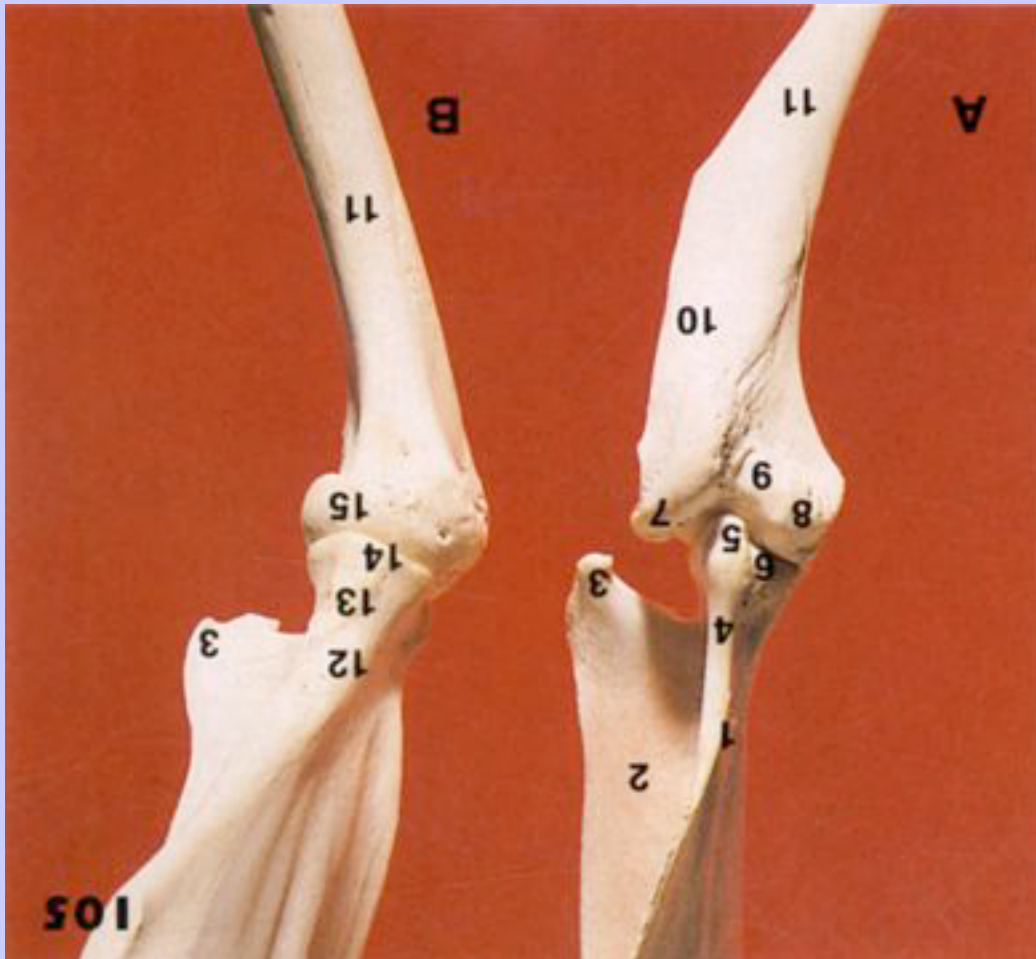
4.0.3

Clinical Note

- 6 Note the groove immediately medial to the greater tubercle with its characteristic foraminae. It is through this groove that an intramedullary pin can be introduced and driven distally to effect immobilisation of a fracture of the body of the humerus.

70

105 Cranial aspect of the left shoulder joint (A) and caudal aspect of the right shoulder joint (B) of a dog.



- 1 Body of scapula
- 2 Scapular spine
- 3 Acromion
- 4 Scapular notch
- 5 Supraglenoid tubercle
- 6 Coracoid process
- 7 Greater tubercle

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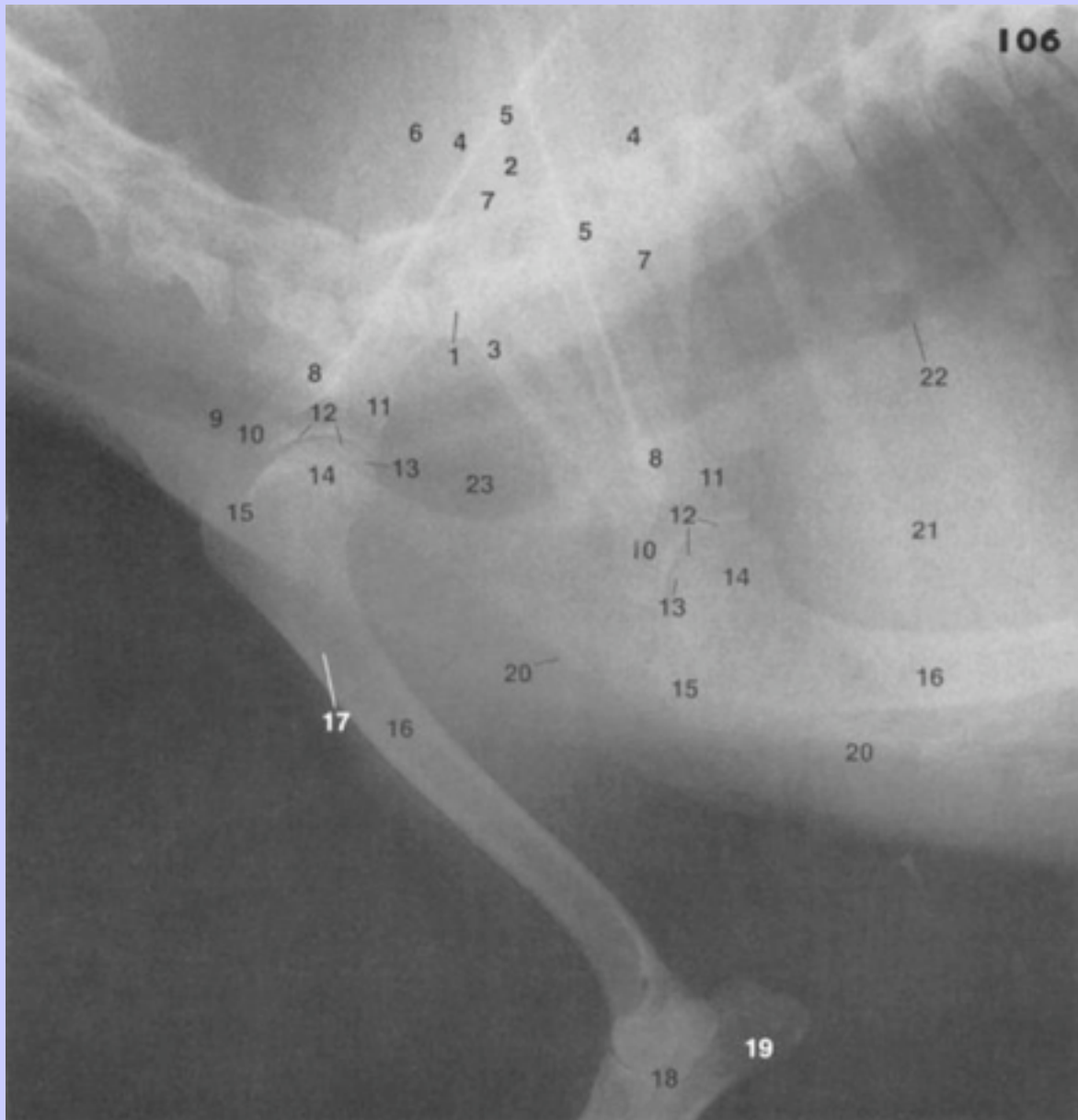
- 8 Lesser tubercle
- 9 Intertubercular groove
- 10 Tricipital line
- 11 Body of humerus
- 12 Neck of scapula
- 13 Infraglenoid tubercle
- 14 Border of glenoid cavity
- 15 Head

4.0.4

Clinical Note

3 & 7 Note the relative positions of these two palpable bony structures. They are used as palpable landmarks when assessing the correct position of the shoulder joint. In cases of dislocation of that joint there would be disparity in the relative approximation of these structures.

106 Lateral radiograph of the shoulder region. The cranially advanced limb is the lower limb in lateral recumbency. To enhance outline, the shoulder joint has been positioned so that its image is superimposed on that of the trachea.



1 Seventh cervical vertebra

2 First thoracic vertebra


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- 3 First rib
- 4 Body of scapula
- 5 Scapular spine
- 6 Supraspinatous fossa
- 7 Infraspinatous fossa
- 8 Acromion process
- 9 Trachea
- 10 Supraglenoid tubercle
- 11 Infraglenoid tubercle
- 12 Glenoid cavity
- 13 Shoulder joint
- 14 Head of humerus
- 15 Greater tubercle
- 16 Body of humerus
- 17 Deltoid tuberosity
- 18 Elbow joint
- 19 Olecranon
- 20 Sternum
- 21 Heart
- 22 Bifurcation of 9
- 23 Oesophagus (gas filled)

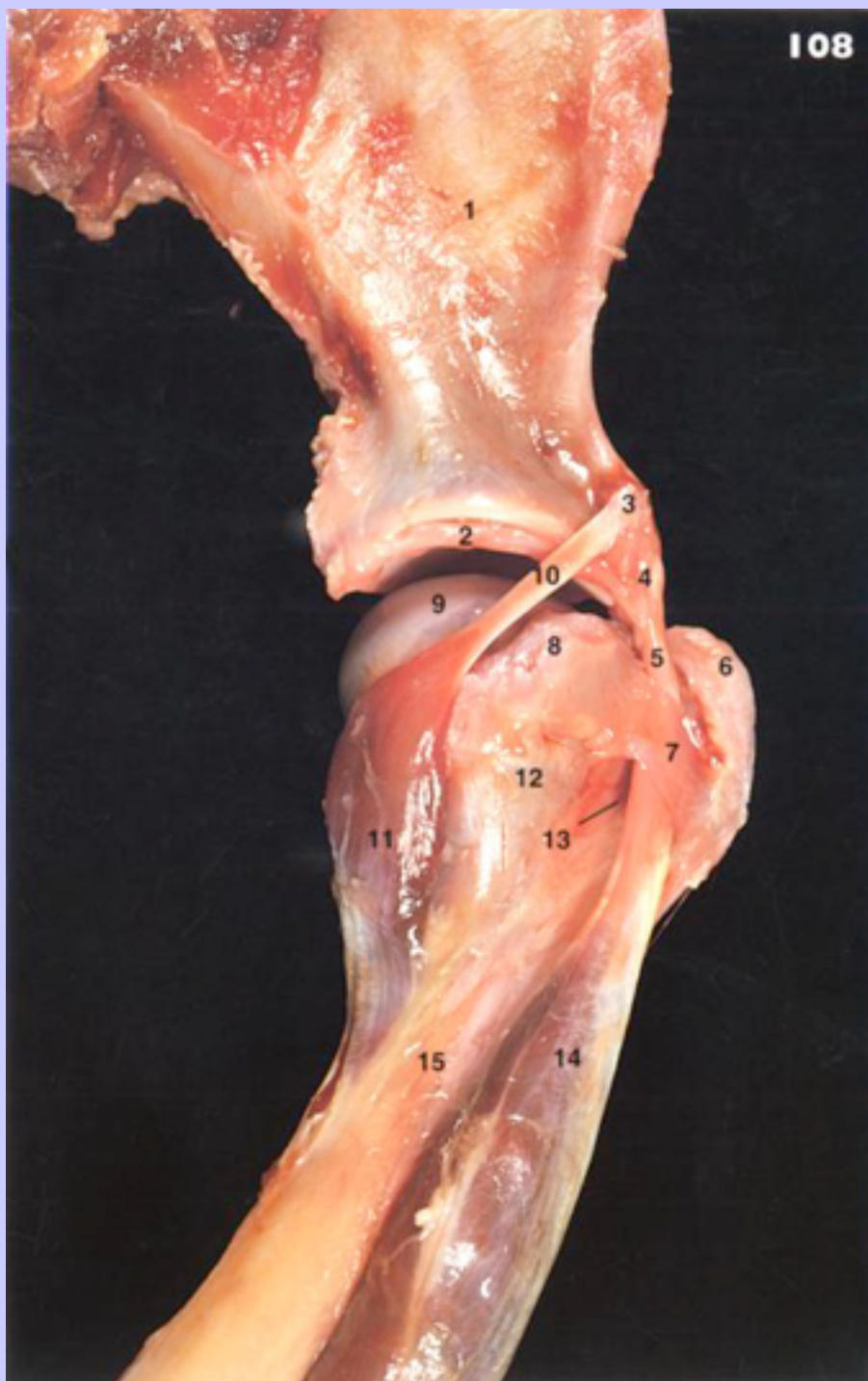
71

- 107 Lateral aspect of the left shoulder joint of a dog. The surrounding musculature has been dissected away to reveal the ligaments of the joint. The tendon of origin of the M. biceps brachii remains *in situ*.



- 
- 1 Scapula
 - 2 Spine of the scapula
 - 3 Acromion
 - 4 Humerus
 - 5 Head of humerus
 - 6 Greater tubercle
 - 7 Tricipital line
 - 8 Tendon of M. biceps brachii
 - 9 Lateral glenohumeral ligament

108 Medial aspect of the left shoulder joint of a dog. The surrounding musculature has been dissected away to reveal the ligaments of the joint. The tendon of origin of the M. biceps brachii remains *in situ*.




- 1 Scapula
- 2 Glenoid cavity
- 3 Coracoid process
- 4 Supraglenoid tubercle
- 5 Tendon of M. biceps brachii in the intertubercular groove
- 6 Greater tubercle
- 7 Transverse humeral ligament
- 8 Lesser tubercle
- 9 Head of humerus
- 10 Tendon of M. coracobrachialis
- 11 M. coracobrachialis
- 12 Cut end of medial glenohumeral ligament
- 13 Intertubercular groove
- 14 M. biceps brachii
- 15 Humerus

72

109 Cranial aspect of the left shoulder joint of a dog. The surrounding musculature has been dissected away to reveal the ligaments of the joint. The tendon of origin of the M. biceps brachii remains *in situ*.



- 
- 1 Scapula
 - 2 Spine of scapula
 - 3 Acromion
 - 4 Glenoid cavity
 - 5 Coracoid process
 - 6 Tendon of M. coracobrachialis
 - 7 Supraglenoid tubercle
 - 8 Tendon of M. biceps brachii
 - 9 Transverse humeral ligament
 - 10 Lesser tubercle
 - 11 Greater tubercle
 - 12 Humerus
 - 13 M. biceps brachii
 - 14 M. coracobrachialis

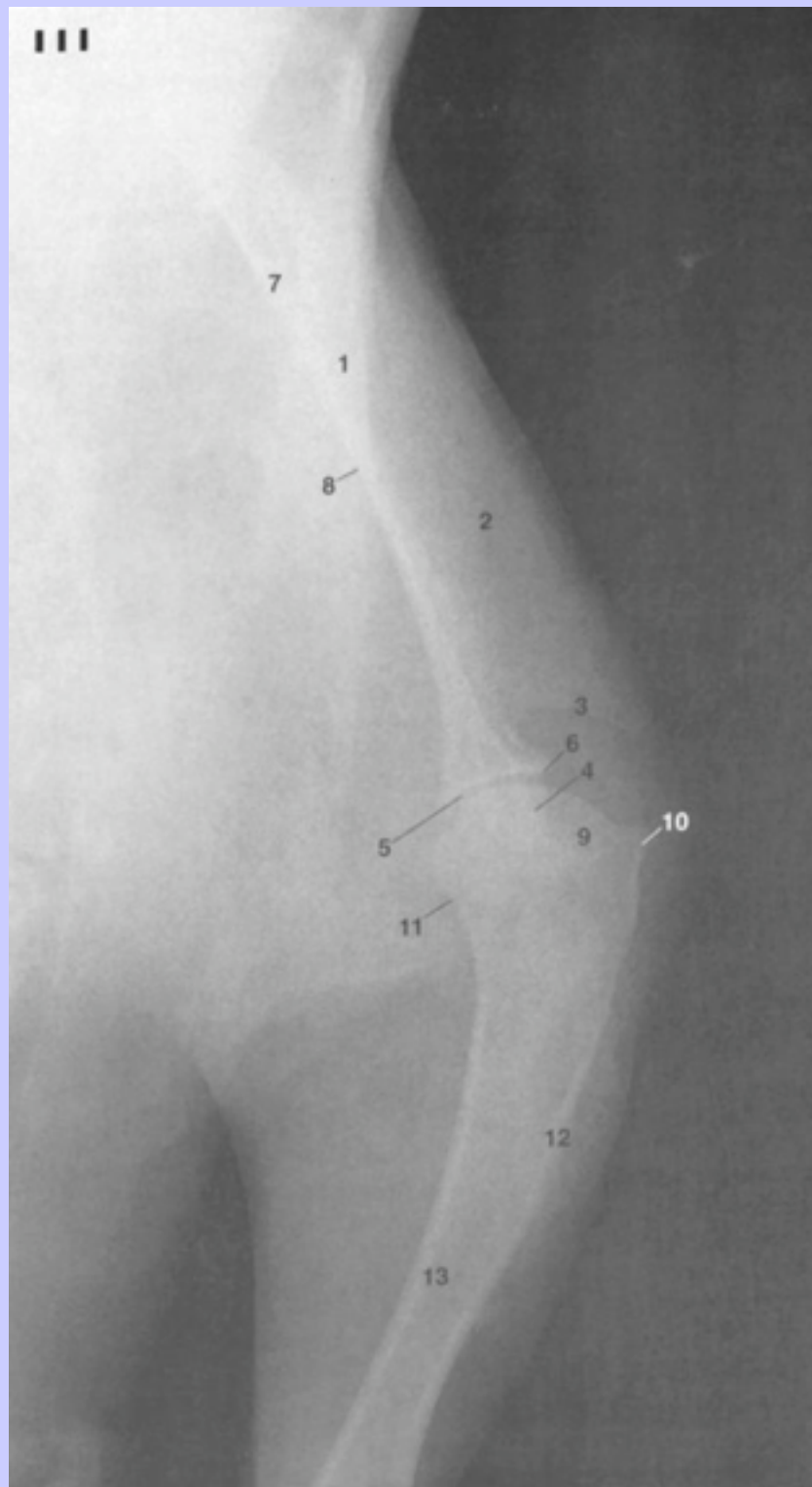
73

110 Mediolateral radiograph of the shoulder region of a puppy, showing the centres of ossification.



- 1 Body of scapula
- 2 Supraglenoid tubercle
- 3 Proximal humeral epiphysis
- 4 Body of humerus
- 5 Distal humeral epiphysis (combined)
- 6 Proximal radial epiphysis
- 7 Body of radius
- 8 Proximal ulnar epiphysis (precursor of olecranon)
- 9 Body of ulna

111 Caudocranial radiograph of the shoulder joint of a dog.





74

112 Craniocaudal radiograph of the shoulder and brachium of a puppy, showing the centres of ossification.



- 1 Body of scapula
- 2 Supraglenoid tubercle
- 3 Proximal humeral epiphysis
- 4 Body of humerus
- 5 Distal humeral epiphysis (combined)
- 6 Proximal ulnar epiphysis (precursor of olecranon)
- 7 Proximal radial epiphysis
- 8 Body of radius
- 9 Body of ulna

113 Craniocaudal radiograph of the thoracic limb of a kitten, showing the supracondylar foramen.

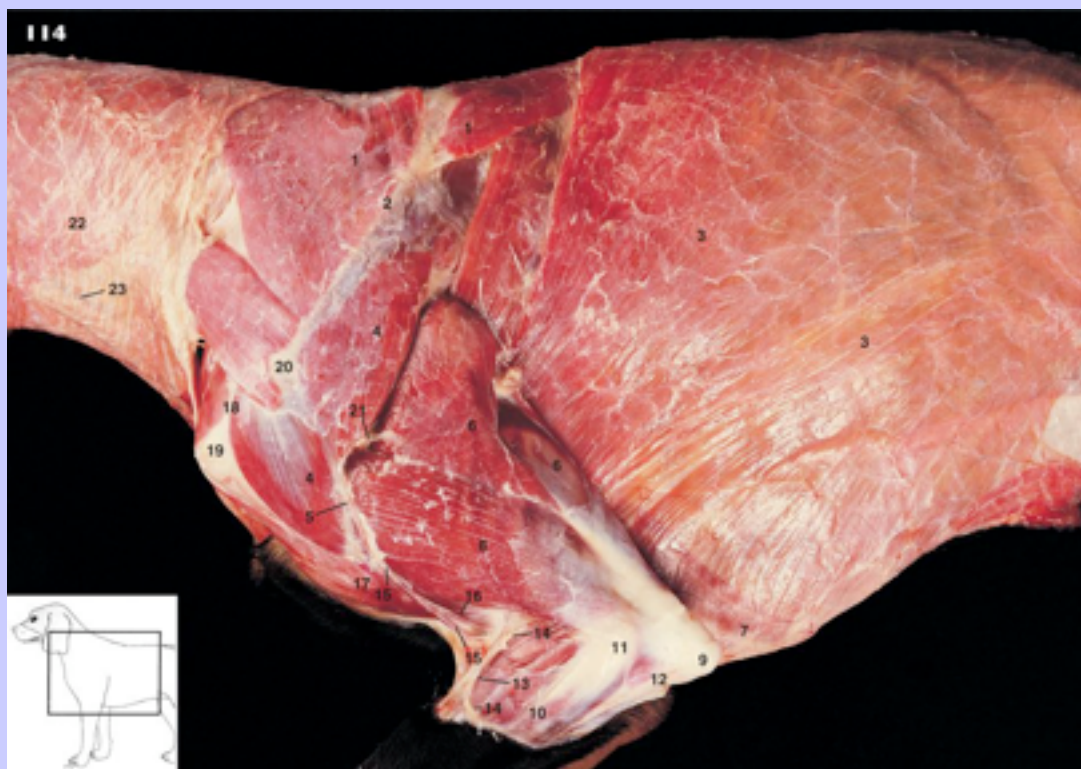


- 1 Scapula
- 2 Suprahumeral process
- 3 Humerus
- 4 Supratrochlear fossa
- 5 Supracondylar foramen
- 6 Radius
- 7 Ulna
- 8 Carpus
- 9 Metacarpals
- 10 First digit
- 11 Second to fifth digits

75

- 114 Lateral aspect of the superficial muscles of the neck, shoulder, thoracic limb and thoracic wall of a dog.

76



- 1 M. trapezius
- 2 Scapular spine
- 3 M. cutaneus trunci
- 4 M. deltoideus
- 5 Axillobrachial vein
- 6 M. triceps brachii (long head)
- 7 M. pectoralis profundus (deep to M. cutaneus trunci)
- 8 M. triceps brachii (lateral head)
- 9 Olecranon
- 10 Extensor group
- 11 Lateral epicondyle of humerus
- 12 M. anconeus
- 13 Superficial brachial artery
- 14 Radial nerve (superficial lateral and medial branches)
- 15 Cephalic vein
- 16 Median cubital vein
- 17 M. cleidobrachialis
- 18 M. supraspinatus
- 19 Greater tubercle of humerus
- 20 Acromion process
- 21 Cranial lateral cutaneous nerve (axillary)
- 22 M. sphincter colli
- 23 External jugular vein

4.0.5

Clinical Note

- 17 The sites for surgical incisions to carry out open reduction of fractures of the humeral body by intramedullary pinning are three in number. A proximal fracture is approached by separating the caudal

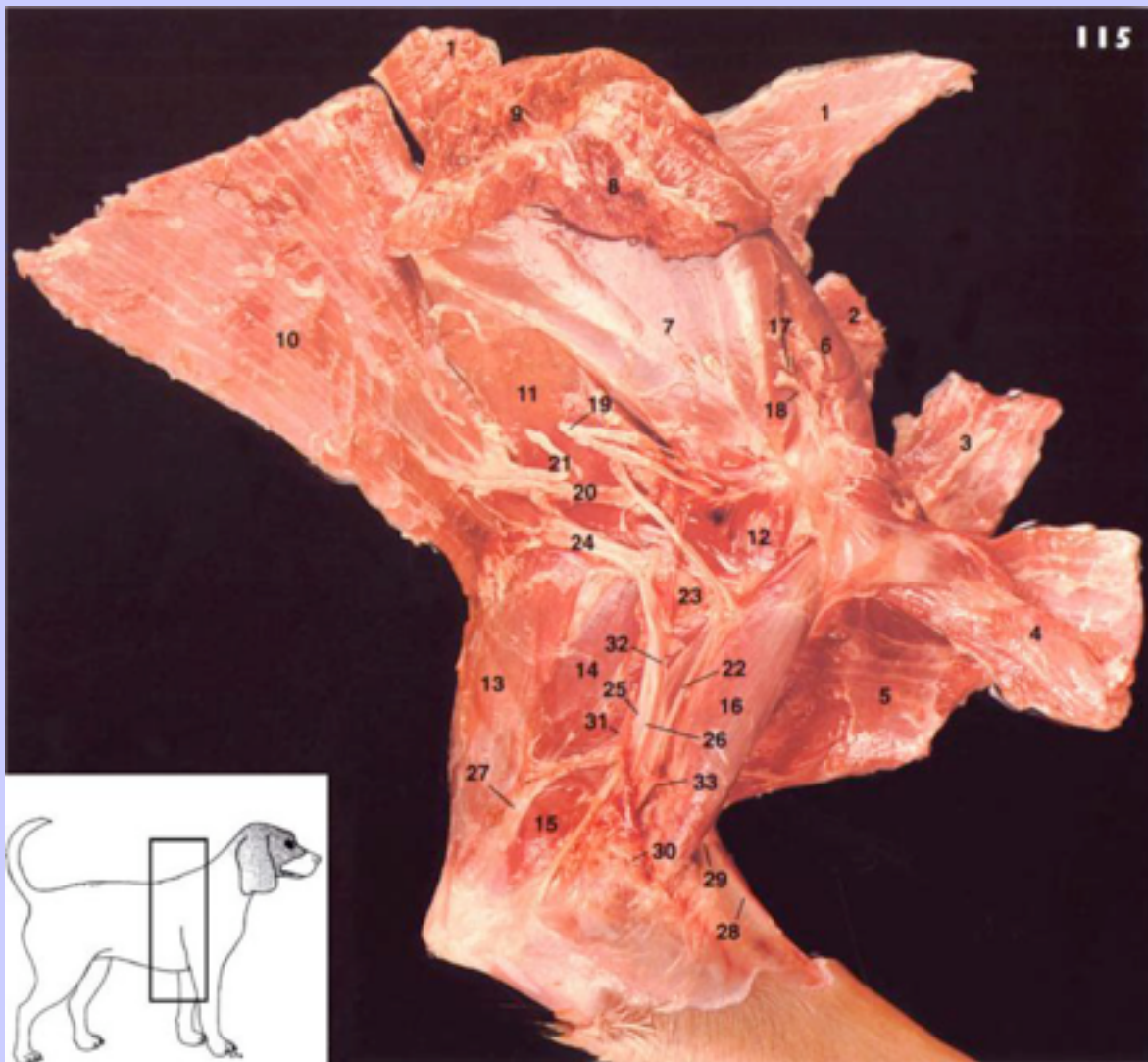
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edge of the M. cleidobrachialis from the cranial edge of the M. triceps (lateral head, 8). A mid-shaft fracture is approached by dividing the caudal edge of the M. cleidobrachialis from the cranial edge of the M. brachialis which is at the level marked 16. A distal fracture is approached by dividing between the caudal edge of the M. brachialis and the cranial edge of the M. triceps at the level marked 14. Note the vulnerability of the radial nerve (14) to trauma at this point.

76

77

115 Medial aspect of the shoulder and brachium of the detached left thoracic limb of a dog. The extrinsic muscles have been sectioned.



- 1 M. trapezius
- 2 M. omotransversarius
- 3 M. cleidobrachialis with nerve

- 4 M. pectoralis profundus
- 5 M. pectorales superficiales
- 6 M. supraspinatus
- 7 M. subscapularis
- 8 M. serratus ventralis (cut edge)
- 9 M. rhomboideus (cut edge)
- 10 M. latissimus dorsi
- 11 M. teres major
- 12 M. coracobrachialis
- 13 M. tensor fasciae antebrachii
- 14 M. triceps brachii (long head)
- 15 M. triceps brachii (medial head)
- 16 M. biceps brachii
- 17 Subscapular nerve
- 18 Suprascapular nerve
- 19 Axillary nerve
- 20 Lateral thoracic nerve
- 21 Thoracodorsal nerve
- 22 Musculocutaneous nerve
- 23 Radial nerve
- 24 Median and ulnar nerve
- 25 Ulnar nerve
- 26 Median nerve
- 27 Caudal cutaneous antebrachial nerve
- 28 Cephalic vein
- 29 Median cubital vein
- 30 Median vein

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31 Brachial vein

32 Brachial artery

33 Bicipital artery

4.0.6

Clinical Note

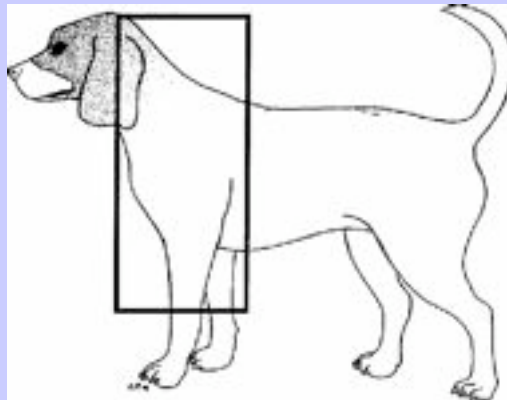
17-27 These peripheral nerves all come from the brachial plexus which lies in the region of the axilla. The brachial plexus is supplied by the ventral branches of spinal nerves C5, 6, 7, 8 & T1. Severe trauma of the brachial plexus would result in motor dysfunction of all of the muscles shown here except the Mm. trapezius (1), omotransversarius (2) and rhomboideus (9), which receive motor nerve supply from dorsal branches of spinal nerves or the spinal accessory nerve (cranial nerve XI). In complete brachial plexus paralysis there would be a loss of sensation to stimulation to the skin over the lateral shoulder region, continuing distally and involving the whole limb surface distal to the elbow. This is a differential diagnosis point when testing between radial nerve and brachial plexus paralysis. In the former condition there would only be loss of sensation over the cranial antebrachium and dorsum of the manus.

77

116 Lateral aspect of the deep muscles of left shoulder and brachium of a dog.
The trapezius and deltoideus muscles have been resected.



- 1 M. triceps brachii (long head)
- 2 M. triceps brachii (lateral head)
- 3 M. triceps brachii (medial head)
- 4 M. teres minor
- 5 M. branchialis
- 6 Radial nerve
- 7 Medial branch } of superficial
- 8 Lateral branch } ramus
- 9 Deep ramus
- 10 Muscular branches to triceps
- 11 M. extensor carpi radialis
- 12 M. anconeus



4.0.7

Clinical Note

- 6** The radial nerve at this level is not so vulnerable to trauma but paralysis from damage here would result in loss of motor supply to the extensors of the elbow, carpus and digits producing an animal with severe dysfunction, unable to stabilise its elbow joint and lower limb. There would be loss of conscious sensation over the cranial antebrachium and dorsum of the manus.

78

117 Lateral aspect of the deep muscles of the shoulder and brachium of the left thoracic limb of a dog. The omotransversarius, trapezius and deltoideus muscles, together with the lateral head of the triceps brachii, have been resected.



- 1 M. rhomboideus
- 2 M. latissimus dorsi
- 3 M. deltoideus (cut edge)
- 4 M. infraspinatus
- 5 M. teres minor
- 6 M. pectoralis profundus
- 7 M. triceps brachii (long head)
- 8 M. triceps brachii (accessory head)
- 9 M. extensor carpi radialis
- 10 M. anconeus
- 11 Radial nerve
- 12 M. brachialis
- 13 Cephalic vein
- 14 Axillobrachial vein
- 15 M. cleidobrachialis
- 16 Acromion process
- 17 Greater tubercle of humerus
- 18 M. supraspinatus
- 19 M. trapezius (cut edge)
- 20 M. omotransversarius (cut edge)
- 21 M. cleidocephalicus, pars cervicalis
- 22 Clavicular tendon

4.0.8

Clinical Note

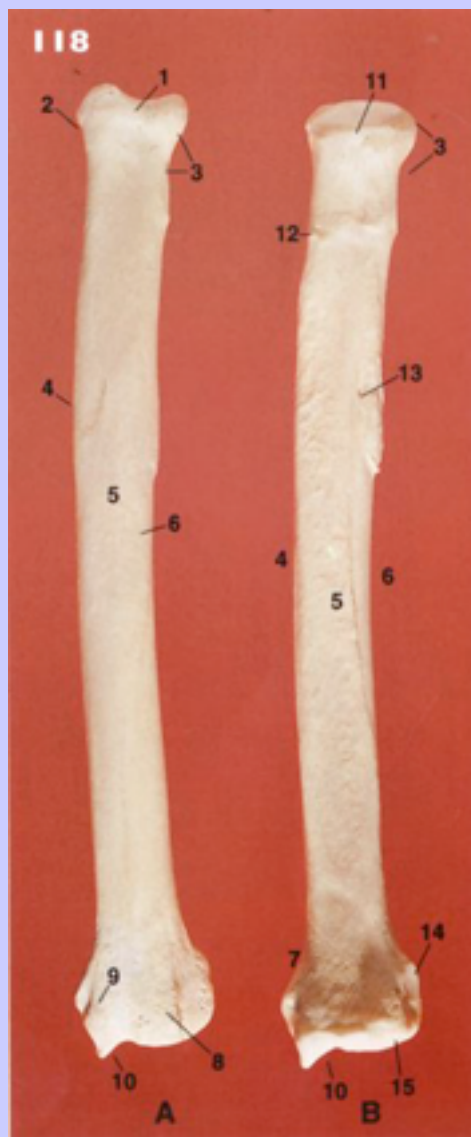
- 5 The teres minor muscle crosses the lateral aspect of the shoulder joint. To gain surgical access from a lateral approach, the two heads of the deltoideus are divided to expose the teres minor, which is then rotated from its position or even sectioned to reveal the joint capsule.

- 11 The radial nerve is shown emerging from its spiralling passage through the brachial groove (musculospiral groove). In this position it is vulnerable to trauma at the time of fracture of the body of the humerus or during surgical repair of such a fracture. Testing for the functional status of the radial nerve can be carried out by stimulating the cranial and dorsal surfaces of the antebrachium and manus to exhibit a conscious reaction. A radial paralysis at this level would cause loss of motor function to the extensors of the carpus and digits but the motor supply to the M. triceps would still function and so the dog could still fix the elbow in extension. Thus the dog could maintain a near normal stance when immobile but on moving forward it would fail to extend the carpus and digits, producing a dragging of the limb with the dorsum of the manus in contact with the ground surface.

79

- 118 Cranial aspect of the left radius (A) and caudal aspect of the right radius (B) of a dog.

80



- 1 Fovea
- 2 Head
- 3 Neck
- 4 Medial border
- 5 Body
- 6 Lateral border
- 7 Groove for M. extensor digitalis communis
- 8 Groove for M. extensor carpi radialis
- 9 Groove for M. abductor pollicis longus
- 10 Styloid process
- 11 Articular circumference
- 12 Radial tuberosity
- 13 Nutrient foramen
- 14 Ulnar notch
- 15 Carpal articular surface

119 Cranial aspect of the left radius (A) and caudal aspect of the right radius (B) of a dog, showing the centres of ossification.



- 1 Body
- 2 Proximal
- 3 Distal

80

120 Lateral aspect of the left radius (A) and medial aspect of the right radius (B) of a dog.



- 1 Fovea
- 2 Head
- 3 Neck
- 4 Body
- 5 Ulnar notch
- 6 Carpal articular surface
- 7 Articular circumference
- 8 Radial tuberosity
- 9 Grooves for extensor muscles
- 10 Styloid process

121 Lateral (A) and medial (B) aspect of the radius of a dog, showing areas of muscle attachment.

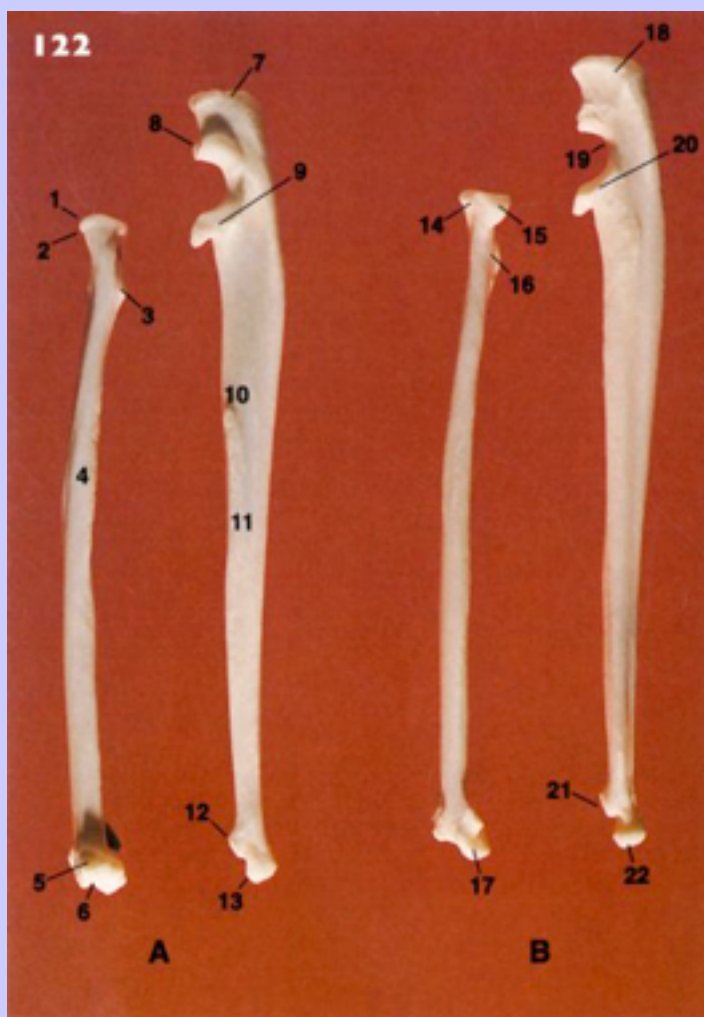


- 1 Supinator
- 2 Pronator teres
- 3 Abductor pollicis longus
- 4 Biceps and brachialis
- 5 Flexor digitorum profundus
- 6 Pronator quadratus
- 7 Brachioradialis

81

82

122 Lateral aspect of the left radius and ulna (A) and medial aspect of the right radius and ulna (B) of a cat.



1 Head	} of radius	12 Ulnar notch
2 Neck		13 Styloid process of ulna
3 Radial tuberosity		14 Articular circumference
4 Body of radius		15 Articular fovea
5 Ulnar notch		16 Radial tuberosity
6 Carpal articular surface		17 Styloid process of radius
7 Olecranon of ulna		18 Olecranon
8 Anconeal process		19 Trochlear notch
9 Coronoid (lateral) process		20 Coronoid (medial) process
10 Interosseous border		21 Articular circumference
11 Body of ulna		22 Styloid process of ulna

123 Cranial aspect of the left ulna (A) and caudal aspect of the right ulna (B) of a dog.



- 1 Olecranon
- 2 Anconeal process
- 3 Trochlear notch
- 4 Coronoid process
- 5 Radial notch
- 6 Ulnar tuberosity
- 7 Interosseous border
- 8 Body
- 9 Articular circumference
- 10 Styloid process

4.0.9

Clinical Note

- 4 It is around this articular surface that movement occurs during pronation and supination.

124 Cranial aspect of the left ulna (A) and caudal aspect of the right ulna (B) of a dog, showing centres of ossification.



- 1 Body
- 2 Proximal
- 3 Distal

125 Lateral aspect of the left ulna (A) and medial aspect of the right ulna (B) of a dog.



- 1 Olecranon
- 2 Anconeal process
- 3 Trochlear notch
- 4 Coronoid process.
- 5 Radial notch
- 6 Body
- 7 Styloid process
- 8 Ulnar tuberosity
- 9 Interosseous border
- 10 Articular circumference

4.0.10 Clinical Note

- 2 The beak-like anconeal process in the standing position of extension of the elbow joint is located within the olecranon fossa of the humerus (see [Figs 127](#), [130](#) & [132](#)). This assists in stabilising the joint so that dislocation of this joint is uncommon and can only happen when the animal receives a blow with the joint in strong flexion or when trauma is accompanied by fracture of a humeral epicondyle.

126 Lateral (A) and medial (B) aspect of the ulna, showing areas of muscle attachment.



1 Triceps

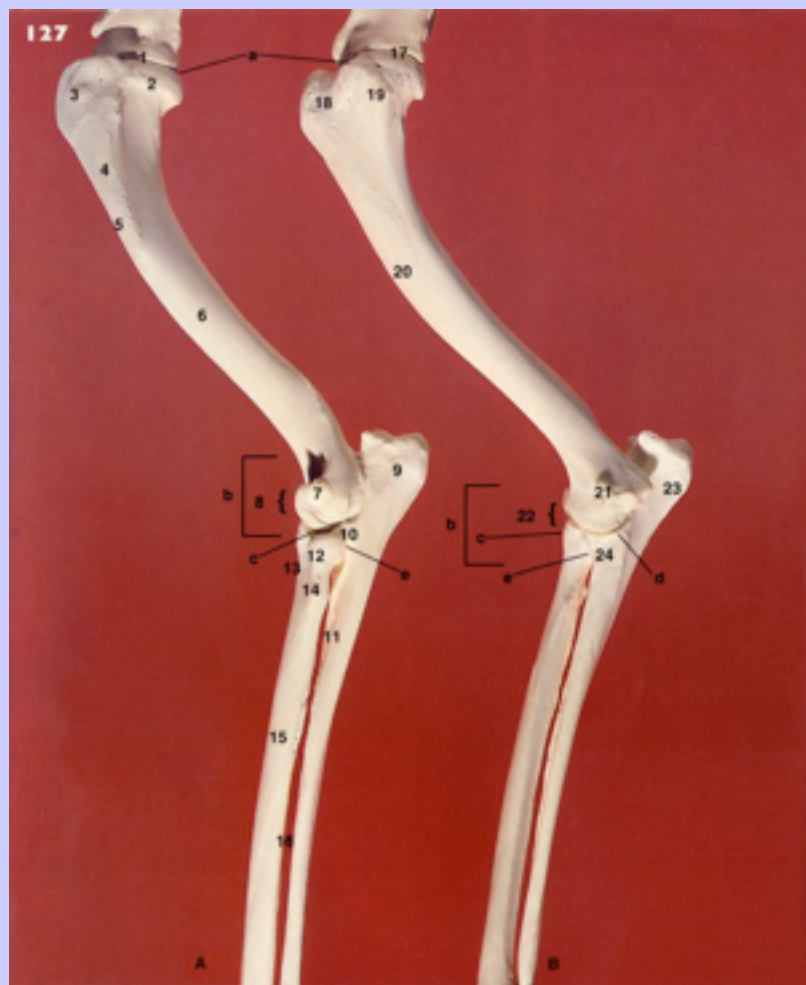
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- 2 Anconeus
- 3 Flexor digitorum profundus
- 4 Abductor pollicis longus
- 5 Extensor pollicis longus
- 6 Tensor fasciae antebrachii
- 7 Flexor carpi ulnaris
- 8 Biceps branchii and branchialis
- 9 Pronator quadratus

83

127 Lateral aspect of the left shoulder and elbow joint (A) and medial aspect of the right shoulder and elbow joint (B) of a dog.

84



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a Shoulder joint	6 Body of humerus	17 Shoulder joint space
b Elbow joint (cubital joint)	7 Lateral epicondyle	18 Intertubercular groove
c Humero-radial joint	8 Condyle	19 Lesser tubercle
d Humero-ulnar joint	9 Olecranon	20 Body
e Proximal radio-ulnar joint	10 Coronoid process	21 Medial epicondyle
1 Glenoid cavity	11 Body of ulna	22 Elbow joint space
2 Head of humerus	12 Fovea	23 Olecranon
3 Greater tubercle	13 Head	24 Ulnar tuberosity
4 Tricipital line	14 Neck	
5 Deltoid tuberosity	15 Body	
	16 Interosseous space	

84


128 Lateral aspect of the left elbow joint of a dog. The M. triceps brachii has been left *in situ* after removal of the other surrounding musculature.



- 1 Humerus
- 2 Supratrochlear foramen
- 3 Capitulum
- 4 Trochlea
- 5 Lateral epicondyle
- 6 Lateral collateral ligament
- 7 M. triceps brachii
- 8 Olecranon
- 9 Annular ligament
- 10 Radius
- 11 Cut edge of M. anconeus
- 12 Ulna
- 13 Interosseus membrane
- 14 M. abductor pollicis longus

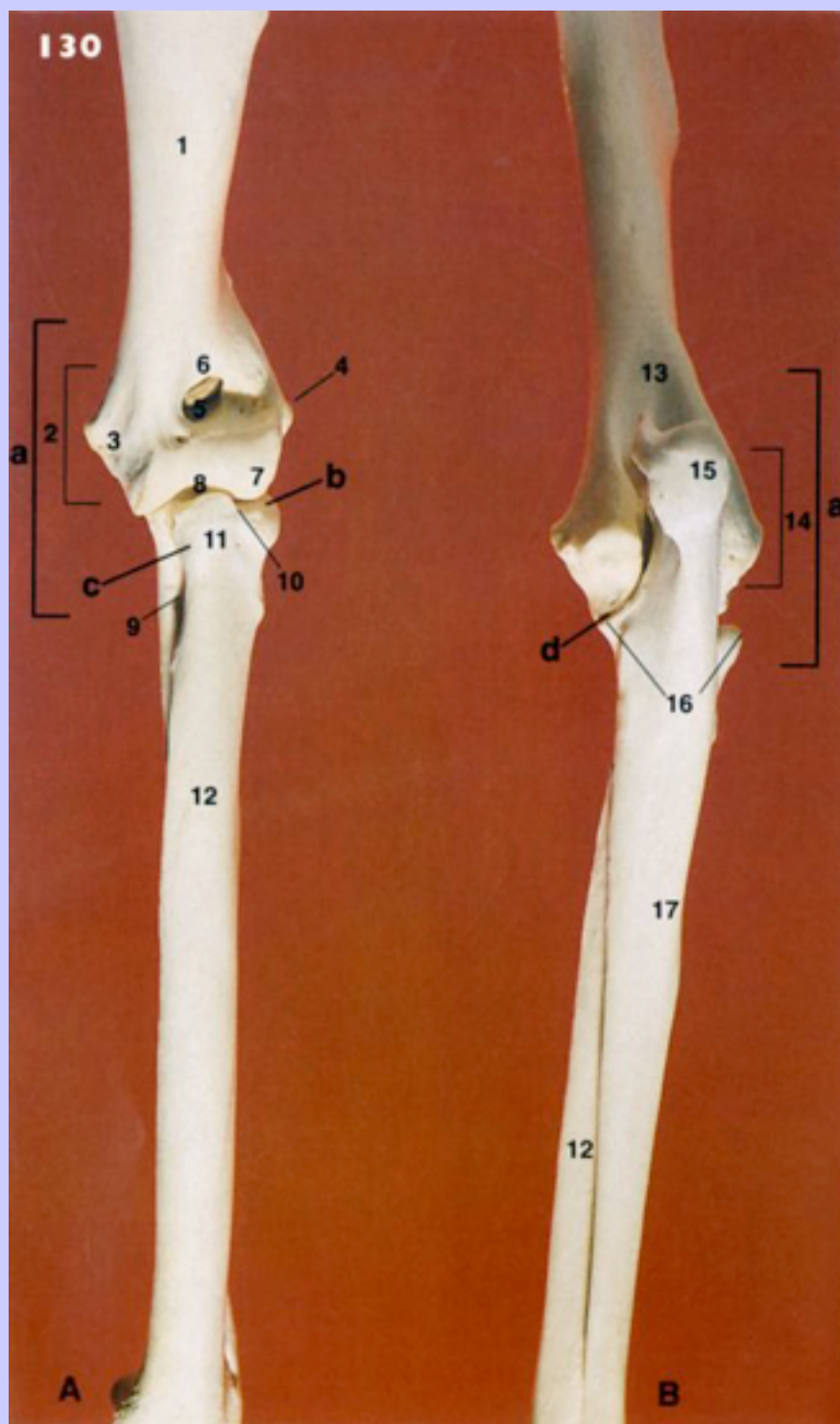
129 Medial aspect of the left elbow joint of a dog. The M. triceps brachii has been left *in situ* after removal of the other surrounding musculature.



- 
- 1 Humerus
 - 2 M. triceps brachii
 - 3 Olecranon
 - 4 Trochlea
 - 5 Capitulum
 - 6 Medial collateral ligament
 - 7 Oblique ligament
 - 8 Medial epicondyle
 - 9 Radius
 - 10 Ulna

85

130 Cranial aspect of the left elbow joint (A) and caudal aspect of the right elbow joint (B) of a dog.



a	Elbow joint (cubital joint)	7	Capitulum
b	Humeroradial joint	8	Trochlea
c	Proximal radio-ulnar joint	9	Ulna
d	Humero-ulnar joint	10	Fovea
		11	Head
		12	Body
1	Body of humerus		} of radius
2	Condyle	13	Olecranon fossa
3	Medial epicondyle	14	Condyle
4	Lateral epicondyle	15	Olecranon
5	Supratrochlear foramen	16	Coronoid process
6	Radial fossa	17	Body of ulna

131 Craniocaudal radiograph of the elbow of a dog.



- 1 Body of humerus
- 2 Elbow joint (cubital joint)
- 3 Proximal radio-ulnar joint
- 4 Lateral epicondyle
- 5 Medial epicondyle
- 6 Border of trochlea of humerus
- 7 Olecranon fossa
- 8 Radius
- 9 Ulna
- 10 Lateral coronoid process
- 11 Medial coronoid process
- 12 Olecranon

86

132 Mediolateral radiograph of the antebrachium and carpus of a dog.



- 1 Body of humerus
- 2 Elbow joint (cubital joint)
- 3 Proximal radio-ulnar joint
- 4 Lateral part of capitulum
- 5 Medial part of trochlea of humerus
- 6 Lateral epicondyle
- 7 Lateral epicondylar crest
- 8 Medial epicondyle
- 9 Medial border of supratrochlear foramen
- 10 Radial tuberosity
- 11 Lateral coronoid process
- 12 Medial coronoid process
- 13 Anconeal process
- 14 Craniolateral tuberosity
- 15 Craniomedial tuberosity
- 16 Olecranon
- 17 Body of radius
- 18 Body of ulna
- 19 Interosseous space
- 20 Radial
- 21 Ulnar
- 22 Accessory
- 23 First
- 24 Second
- 25 Third
- 26 Fourth
- 27 Sesamoid bone in tendon of M. abductor pollicis longus
- 28 Distal radio-ulnar joint
- 29 Antebrachiocarpal joint
- 30 Middle carpal joint
- 31 Carpometacarpal joint
- 32 Styloid process of radius
- 33 Styloid process of ulna
- 34 First metacarpal bone
- 35 Second to fifth metacarpal bones
- 36 Carpal pad
- 37 Proximal sesamoid (palmar)
- 38 First phalanx
- 39 Third phalanx
- 40 Proximal sesamoid (palmar)

133 Mediolateral radiograph of the antebrachium, carpus and manus of a puppy, showing centres of ossification.



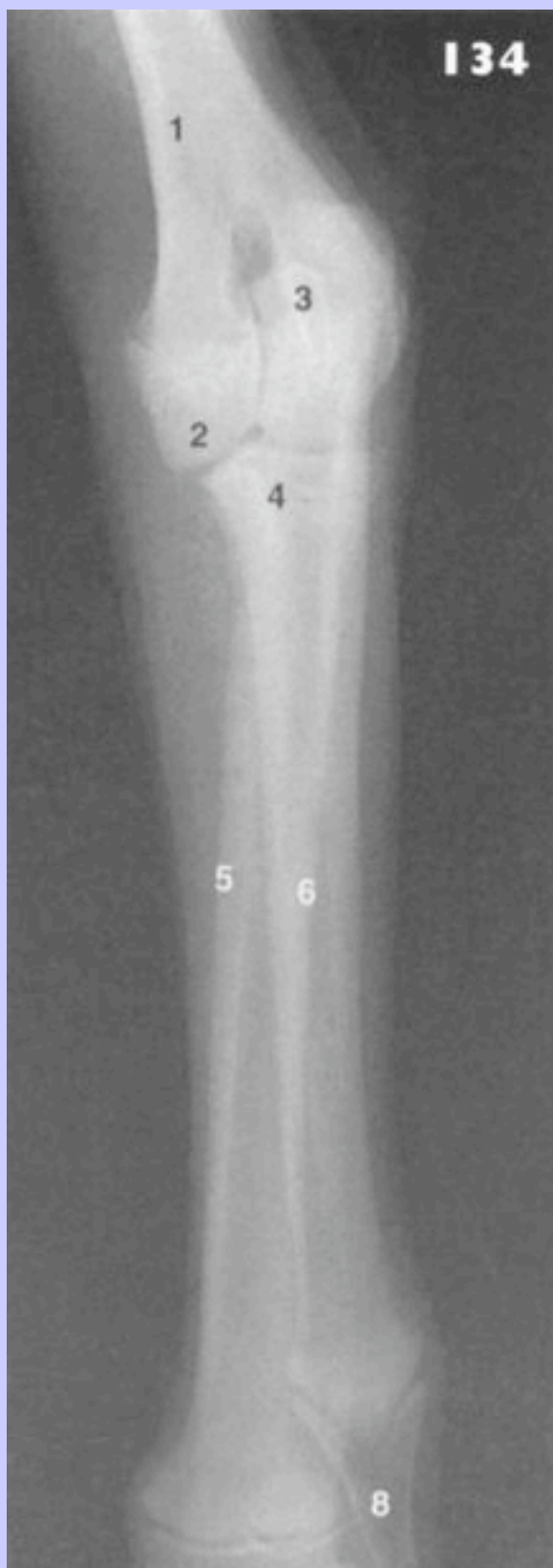
- 1 Body of humerus
- 2 Distal humeral epiphysis (combined)
- 3 Proximal radial epiphysis
- 4 Proximal ulnar epiphysis (precursor of olecranon)
- 5 Body of radius
- 6 Body of ulna
- 7 Distal radial epiphysis
- 8 Distal ulnar epiphysis
- 9 Free epiphysis of accessory carpal bone
- 10 Body of metacarpus
- 11 Distal metacarpal epiphysis
- 12 Body of first phalanx
- 13 First phalangeal proximal epiphysis
- 14 Body of second phalanx
- 15 Second phalangeal proximal epiphysis
- 16 Body of third phalanx

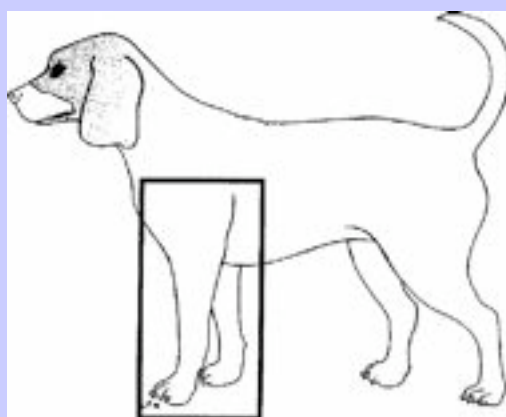
4.0.11 **Clinical Note**

- 4 The centre for the olecranon is normally the only centre of ossification at the proximal end of the ulna. It is vulnerable to distraction in the young dog due to the strong pull of the M. triceps during extension of the elbow joint. On occasions a separate centre can be found for the anconeal process (13 in [Fig. 132](#)) which, if it fails to unite with the diaphysis, can produce pathological changes within the joint. This condition has a breed predisposition, e.g. German Shepherd dogs.
- 9 Note that the accessory carpal bone has two centres of ossification. As the major flexors of the carpus attach here it is vulnerable to distraction.

134 Dorsopalmar radiograph of the antebrachium, carpus and manus of a puppy, showing centres of ossification.

89





- 1 Body of humerus
- 2 Distal humeral epiphysis (combined)
- 3 Proximal ulnar epiphysis (precursor of olecranon)
- 4 Proximal radial epiphysis
- 5 Body of radius
- 6 Body of ulna
- 7 Distal radial epiphysis
- 8 Distal ulnar epiphysis
- 9 Body of metacarpus
- 10 Distal metacarpal epiphysis
- 11 Body of first phalanx
- 12 First phalangeal proximal epiphysis
- 13 Body of second phalanx
- 14 Second phalangeal proximal epiphysis
- 15 Body of third phalanx

135 Lateral aspect of the antebrachium and manus of the left thoracic limb of a dog.



- 1 M. triceps brachii
- 2 Lateral epicondyle of humerus
- 3 M. extensor carpi radialis
- 4 M. extensor digitorum communis
- 5 M. extensor digitorum lateralis
- 6 M. extensor carpi ulnaris (M. ulnaris lateralis)
- 7 Olecranon
- 8 M. flexor carpi ulnaris (ulnar head)
- 9 Carpal pad
- 10 Cephalic vein

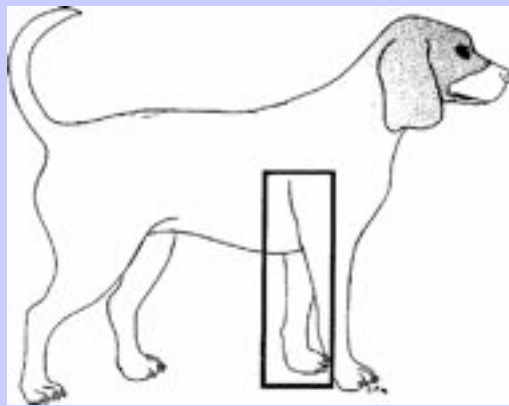
4.0.12 Clinical Note

- 2 Note that all of the extensors of the carpus and digits have an origin from the lateral epicondyle. This is a useful *aide-mémoire* when trying to allocate names and function to the muscles of the region.

89

136 Medial aspect of the antebrachium and manus of the left thoracic limb of a dog. The limb has been removed from its attachment to the trunk.





- 1 M. triceps brachii
- 2 M. biceps brachii
- 3 Mm. pectorales superiores
- 4 Pectoral nerve
- 5 Brachial vein
- 6 Brachial artery
- 7 Superficial radial artery
- 8 Median nerve
- 9 Cephalic vein
- 10 Medial branch of superficial ramus of radial nerve
- 11 Medial epicondyle of humerus
- 12 Olecranon
- 13 M. extensor carpi radialis
- 14 M. brachioradialis
- 15 M. pronator teres
- 16 M. flexor carpi radialis
- 17 M. flexor digitorum superficialis
- 18 Ulnar nerve

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19 M. flexor carpi ulnaris (ulnar head)

20 M. flexor digitorum profundus (humeral head)

4.0.13

Clinical Note

11 Note that all of the flexors of the carpus and digits have an origin from the medial epicondyle. This is a useful *aide-mémoire* when trying to allocate names and function to the muscles of the region.

137 Cranial aspect of the antebrachium and dorsal aspect of the manus of the left thoracic limb of a dog.





- 1 M. extensor carpi radialis
- 2 M. brachioradialis
- 3 Cephalic vein
- 4 Medial and lateral branches of superficial ramus of radial nerve
- 5 M. extensor digitorum communis
- 6 M. extensor digitorum lateralis
- 7 M. abductor pollicis longus
- 8 Tendon of M. extensor carpi lateralis (M. ulnar lateralis)
- 9 Tendon of 6
- 10 Tendon of 5
- 11 Site of dorsal sesamoid
- 12 Extensor tendon
- 13 Accessory cephalic vein
- 14 Dorsal metacarpal veins
- 15 Dorsal common digital arteries, veins and nerves

4.0.14 Clinical Note

3 This is the position at which venepuncture is frequently performed in the dog and cat. Note the close proximity of the medial and lateral branches of the superficial ramus of the radial nerve (4). The parallel course of the nerves to the vein can cause problems if there is leakage of potentially irritant pharmaceutical preparations perivenously. The animals will often self-mutilate the skin around the injection site, producing deep ulceration.

90

138 Dorsal aspect of the carpus and manus of the left thoracic limb of a dog. The tendons of the extensor muscles of the carpus and digits have been exposed by removal of the M. abductor pollicis longus.

91



- 1 Proximal row of carpal bones
- 2 Distal row of carpal bones
- 3 First digit
- 4 Position of sesamoid in tendon of M. abductor pollicis longus
- 5 Tendon of M. extensor carpi radialis (longus)
- 6 Tendon of M. extensor carpi radialis (brevis)
- 7 Tendons of M. extensor digitorum communis
- 8 Tendons of M. extensor digitorum lateralis
- 9 Tendons of Mm. interossei as they travel from the palmar to the dorsal aspect to become confluent with 7
- 10 Position of dorsal sesamoid
- 11 Dorsal elastic ligament
- 12 Tendon of M. extensor pollicis longus and indicis proprius

- 139 Dorsal aspect of the carpus and manus of the left thoracic limb of a dog.
The tendon of the common digital extensor muscle has been cut proximally
and reflected distally.



- 1 First digit
- 2 Fifth digit
- 3 Second metacarpal bone
- 4 Tendons of M. extensor digitorum communis
- 5 Tendons of M. extensor digitorum lateralis
- 6 Position of dorsal sesamoid in tendon of 4
- 7 Tendon of M. extensor carpi radialis (longus)
- 8 Tendon of M. extensor carpi radialis (brevis)
- 9 Tendon of the M. extensor pollicis longus and indicis proprius

91

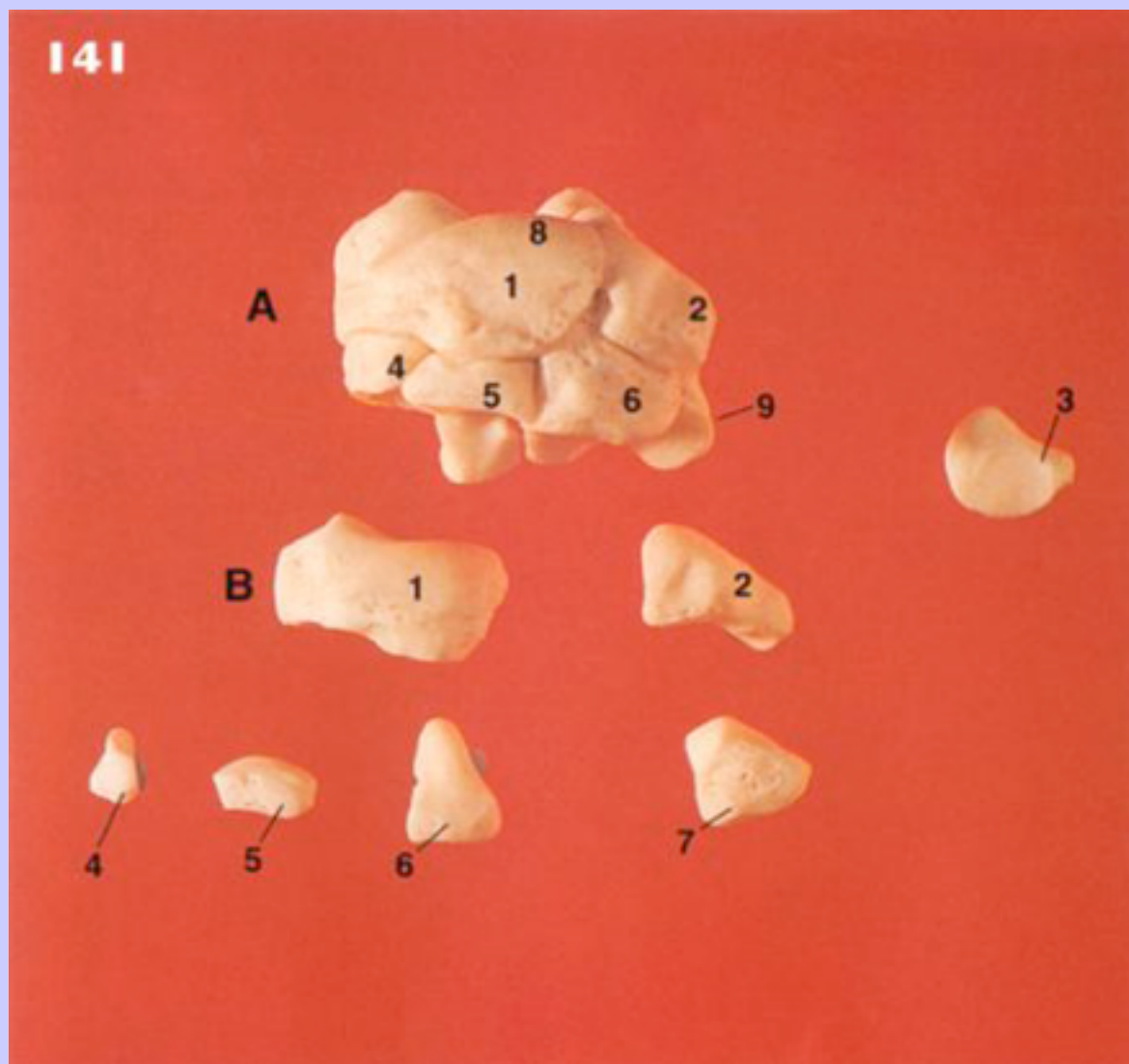
140 Caudal aspect of the antebrachium and palmar aspect of the manus of the left thoracic limb of a dog. The pads have been left intact.





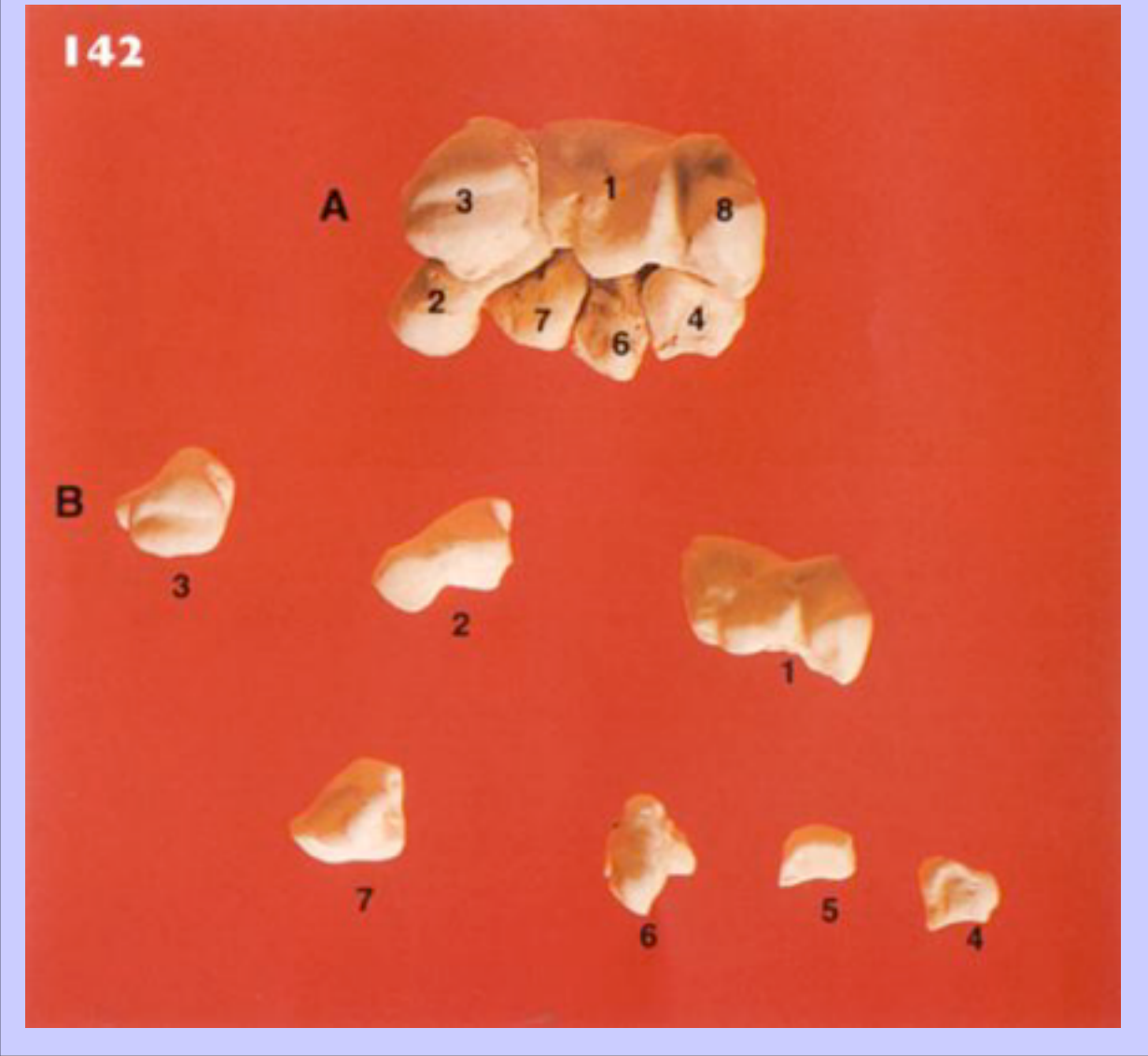
- 1 Olecranon
- 2 Median vessels
- 3 M. flexor carpi ulnaris (ulnar head)
- 4 M. extensor carpi ulnaris (M. ulnaris lateralis)
- 5 M. flexor digitorum superficialis
- 6 M. flexor carpi ulnaris (humeral head)
- 7 Carpal pad
- 8 M. abductor pollicis brevis
- 9 M. abductor digiti quinti
- 10 M. flexor digiti quinti
- 11 Tendons of 5
- 12 First digit
- 13 Metacarpal pad
- 14 Digital pads

141 Dorsal aspect of the left carpus of a dog, in the articulated (A) and the separated (B) form.



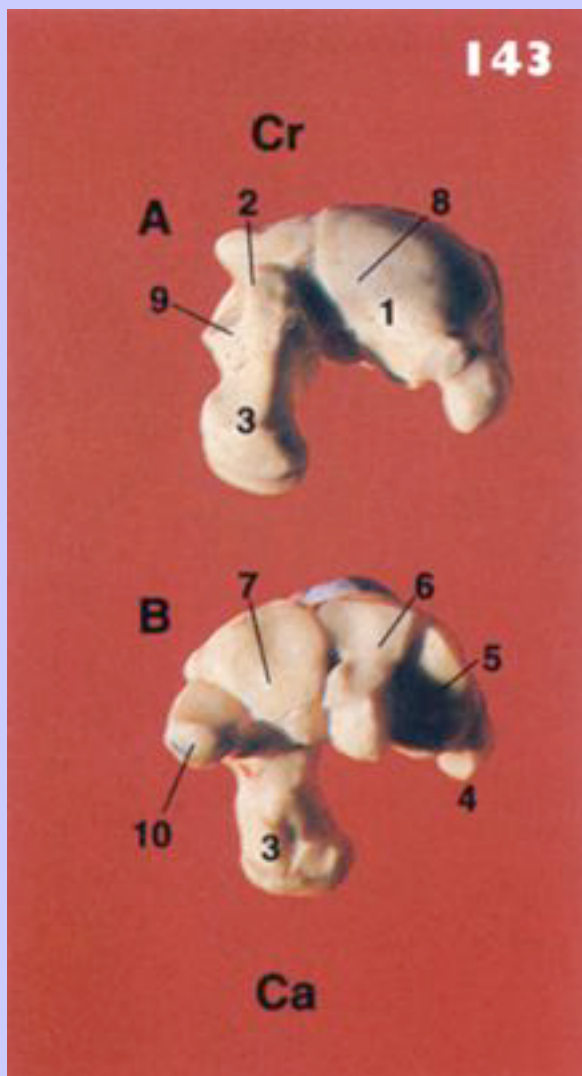
- | | | |
|------------------------------|---|-------------|
| 1 Radial | } | carpal bone |
| 2 Ulnar | | |
| 3 Accessory | | |
| 4 First | | |
| 5 Second | | |
| 6 Third | | |
| 7 Fourth | | |
| 8 Articular facet for radius | | |
| 9 Lateral process of 2 | | |

142 Palmar aspect of the left carpus of a dog in the articulated (A) and the separated (B) form.



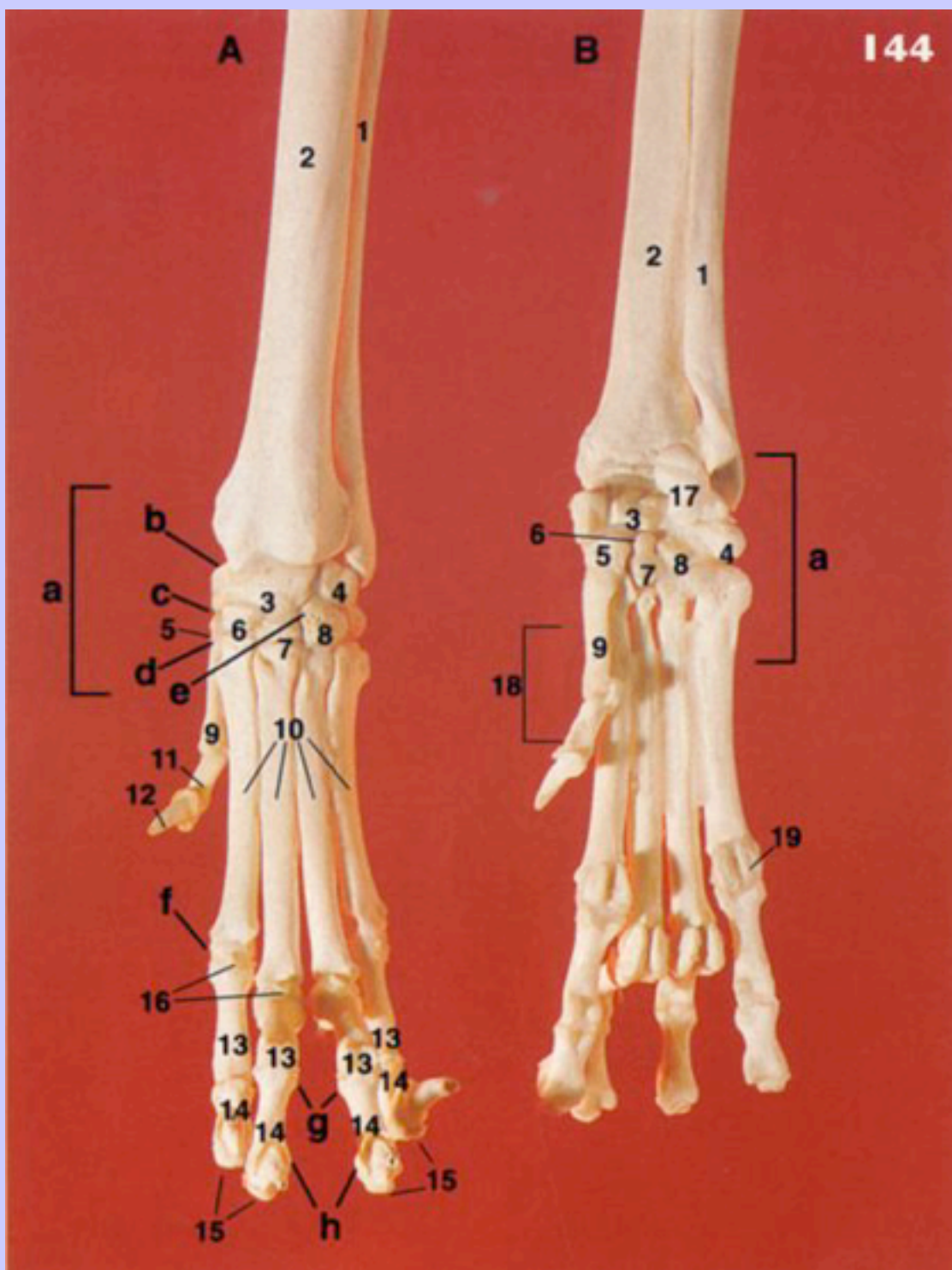
- | | |
|---|---------------|
| 1 Radial | } carpal bone |
| 2 Ulnar | |
| 3 Accessory | |
| 4 First | |
| 5 Second | |
| 6 Third | |
| 7 Fourth | |
| 8 Sulcus for tendon of M. flexor carpi radialis | |

143 Proximal aspect of the left carpus (A) and distal aspect of the right carpus (B) of a dog, oriented cranially (Cr) and caudally (Ca).



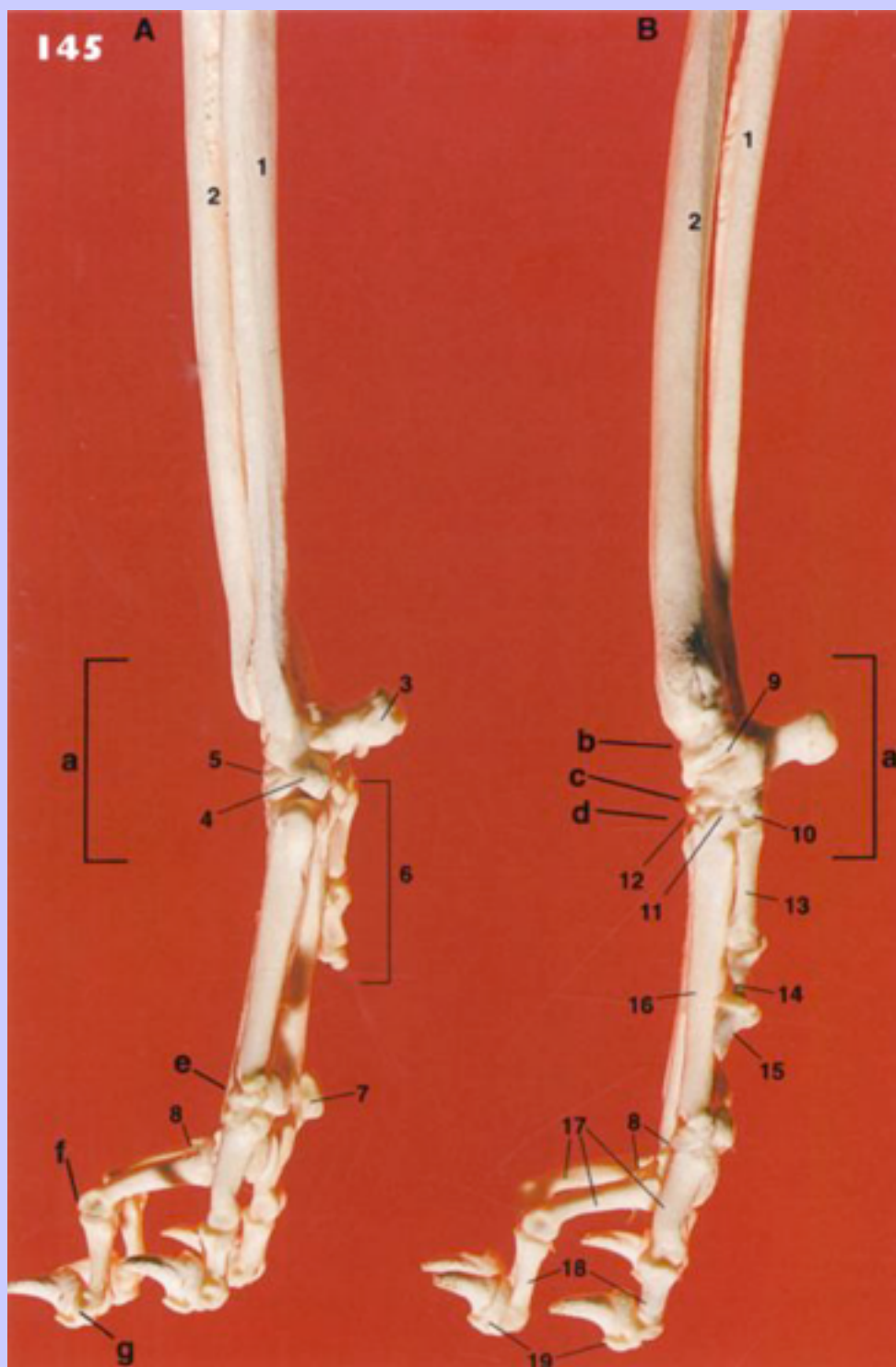
- | | |
|-----------------------------|---------------|
| 1 Radial | } carpal bone |
| 2 Ulnar | |
| 3 Accessory | |
| 4 First | |
| 5 Second | |
| 6 Third | |
| 7 Fourth | |
| 8 Articular face for radius | |
| 9 Articular face for ulna | |
| 10 Palmar process of 2 | |

144 Dorsal aspect of the left carpus and manus (A), and palmar aspect of the right carpus and manus (B) of a dog.



- | | | | |
|---|--------------------------------|----|----------------------------------|
| a | Carpal joints | 9 | First metacarpal bone |
| b | Antebrachiocarpal joint | 10 | Second to fifth metacarpal bones |
| c | Middle carpal joint | 11 | Proximal phalanx |
| d | Carpometacarpal joints | 12 | Distal phalanx |
| e | Intercarpal joints | 13 | Proximal phalanges |
| f | Metacarpophalangeal joints | 14 | Middle phalanges |
| g | Proximal interphalangeal joint | 15 | Distal phalanges |
| h | Distal interphalangeal joint | 16 | Dorsal sesamoids |
| 1 | Body of ulna | 17 | Accessory carpal bone |
| 2 | Body of radius | 18 | First digit |
| 3 | Radial | 19 | Palmar sesamoids |
| 4 | Ulnar | | |
| 5 | First | | |
| 6 | Second | | |
| 7 | Third | | |
| 8 | Fourth | | |
- } of first digit
 } of second to fifth digits
 } carpal bone

145 Lateral aspect of the left carpus and manus (A), and medial aspect of the right carpus and manus (B) of a dog.

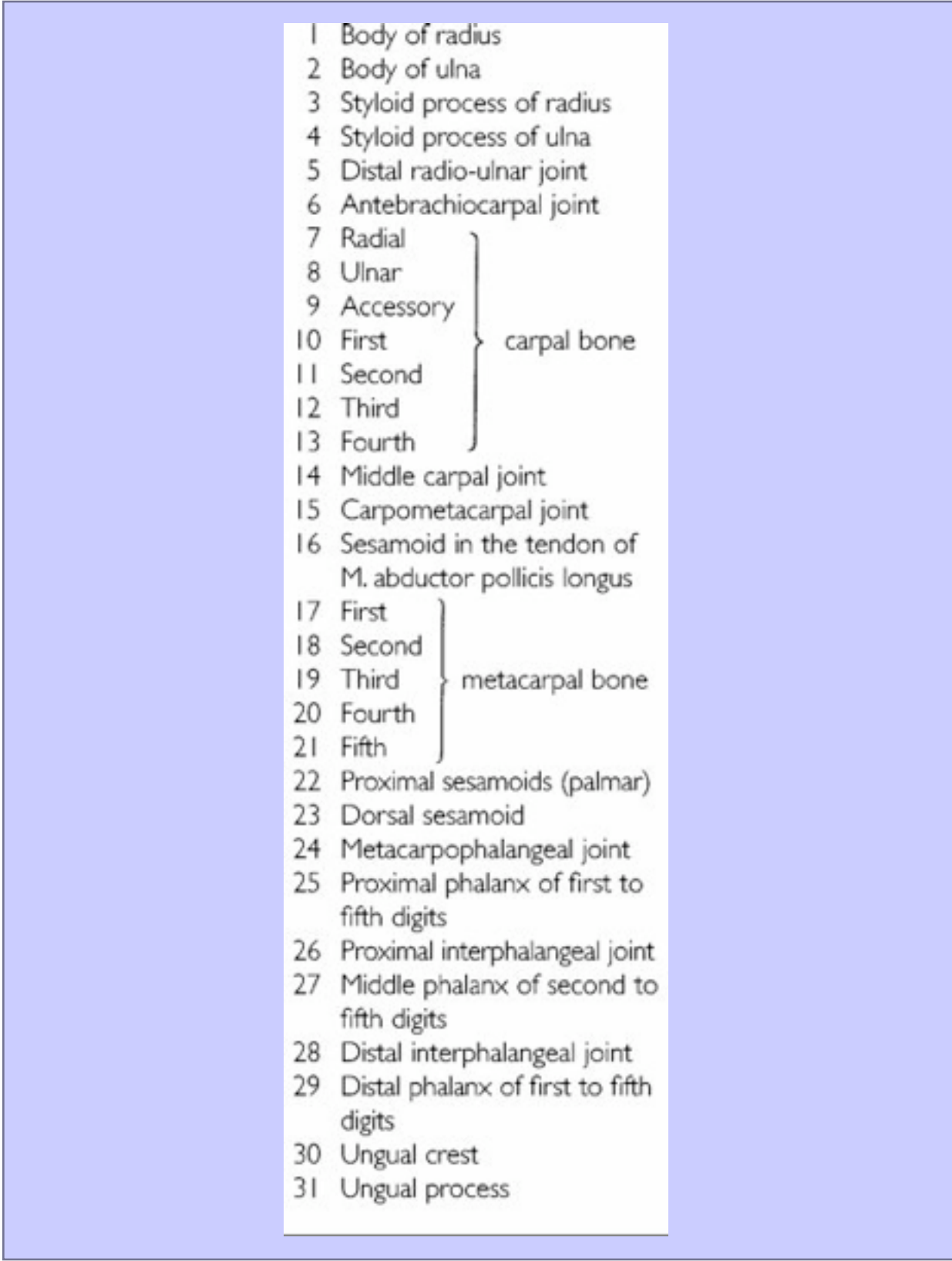


- | | | | |
|---|--------------------------------|----|------------------------|
| a | Carpal joints | 7 | Palmar sesamoids |
| b | Antebrachiocarpal joint | 8 | Dorsal sesamoids |
| c | Middle carpal joint | 9 | Radial |
| d | Carpometacarpal joints | 10 | First |
| e | Metacarpophalangeal joint | 11 | Second |
| f | Proximal interphalangeal joint | 12 | Third |
| g | Distal interphalangeal joint | 13 | First metacarpal bone |
| 1 | Body of ulna | 14 | Proximal phalanx |
| 2 | Body of radius | 15 | Distal phalanx |
| 3 | Accessory | 16 | Second metacarpal bone |
| 4 | Ulnar | 17 | Proximal phalanges |
| 5 | Fourth | 18 | Middle phalanges |
| 6 | First digit | 19 | Distal phalanges |
- } carpal bone (for items 10, 11, 12)
 } of first digit (for items 14, 15)
 } of second to fifth digits (for items 17, 18, 19)

146 Dorsopalmar radiograph of the carpus and manus of a dog.





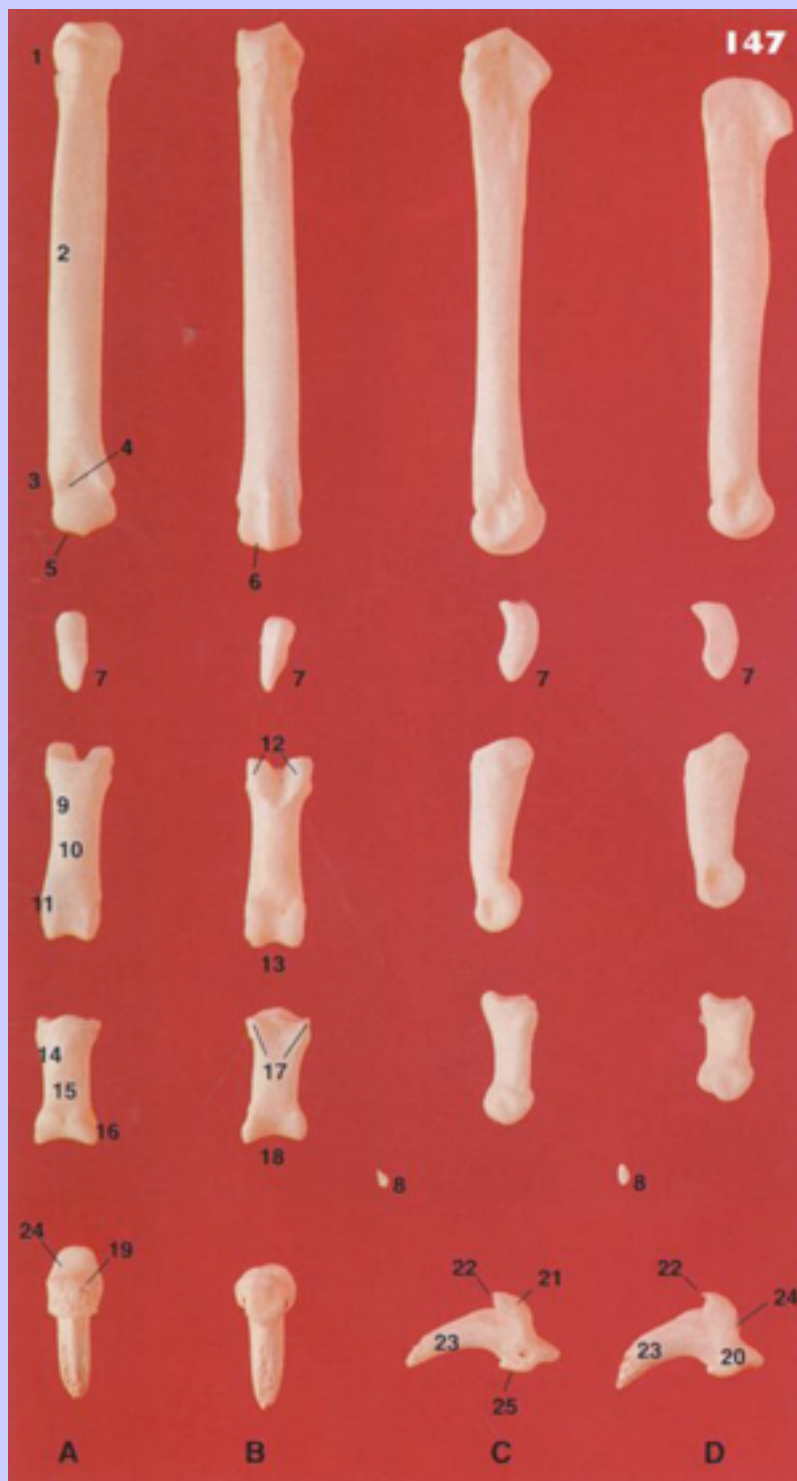
- 
- 1 Body of radius
2 Body of ulna
3 Styloid process of radius
4 Styloid process of ulna
5 Distal radio-ulnar joint
6 Antebrachiocarpal joint
7 Radial
8 Ulnar
9 Accessory
10 First
11 Second
12 Third
13 Fourth
14 Middle carpal joint
15 Carpometacarpal joint
16 Sesamoid in the tendon of
M. abductor pollicis longus
17 First
18 Second
19 Third
20 Fourth
21 Fifth
22 Proximal sesamoids (palmar)
23 Dorsal sesamoid
24 Metacarpophalangeal joint
25 Proximal phalanx of first to
fifth digits
26 Proximal interphalangeal joint
27 Middle phalanx of second to
fifth digits
28 Distal interphalangeal joint
29 Distal phalanx of first to fifth
digits
30 Ungual crest
31 Ungual process
- The diagram shows the skeletal structure of a thoracic limb. Brackets on the right side of the list group items 7-9 as 'carpal bone' and items 17-21 as 'metacarpal bone'. The list continues with various joints, phalanges, and sesamoids, ending with the ungual crest and process.

4.0.15 Clinical Note

- 16** The tendon of insertion of the M. abductor pollicis longus has an intercalated sesamoid bone as the tendon passes from lateral to medial over the radial carpal bone. Care should be taken to identify this structure as a normal feature and not as a chip fracture.
- 23** Each tendon of insertion of the M. extensor digitorum communis passes over a dorsal sesamoid at the level of the metacarpophangeal joint (see [Fig. 144](#), **16**). This should be recognised as a normal feature in canine radiographs of this region. A similar situation occurs in the cat but the sesamoid is commonly cartilaginous in nature.

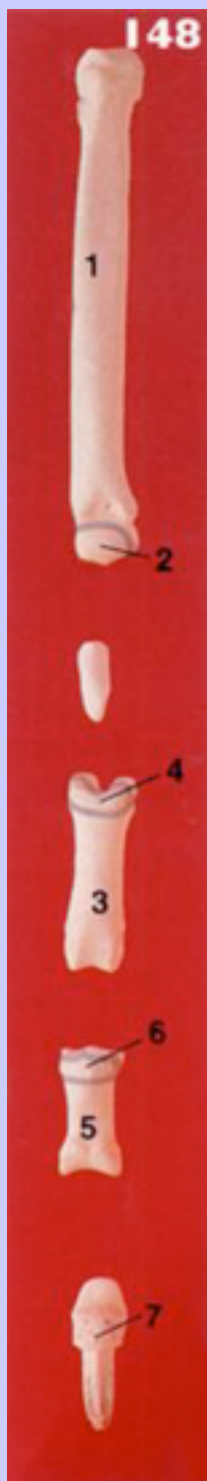
94

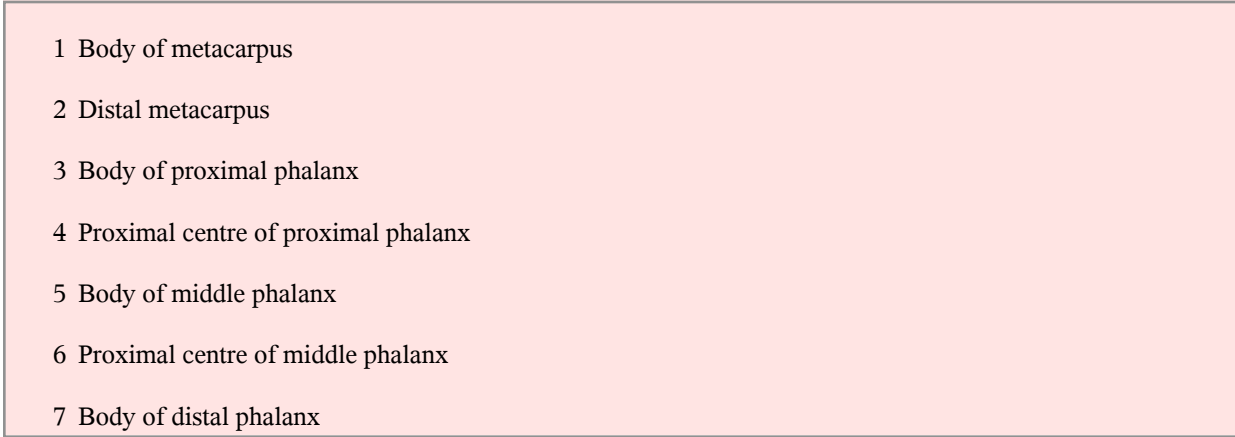
147 Dorsal (A), palmar (B), axial (C) and abaxial (D) aspects of the bones of a typical digit in the manus of a dog.



1	Base	} of metacarpal	17	Fovea with palmar tubercles and sagittal ridge	
2	Body				
3	Head				
4	Sesamoid fossa		18	Trochlea	
5	Trochlea		19	Base	} of distal phalanx
6	Sesamoid crest		20	Body	
7	Proximal sesamoid		21	Extensor tubercle	
8	Dorsal sesamoid		22	Ungual crest	
9	Base	} of proximal phalanx	23	Ungual process	
10	Body				
11	Head				
12	Fovea with palmar tubercles		24	Articular surface	
13	Trochlea		25	Insertion of M. flexor digitorum profundus	
14	Base	} of middle phalanx			
15	Body				
16	Head				

148 Dorsal aspect of a typical digit in the manus of a dog, showing centres of ossification.



- 
- 1 Body of metacarpus
 - 2 Distal metacarpus
 - 3 Body of proximal phalanx
 - 4 Proximal centre of proximal phalanx
 - 5 Body of middle phalanx
 - 6 Proximal centre of middle phalanx
 - 7 Body of distal phalanx

95

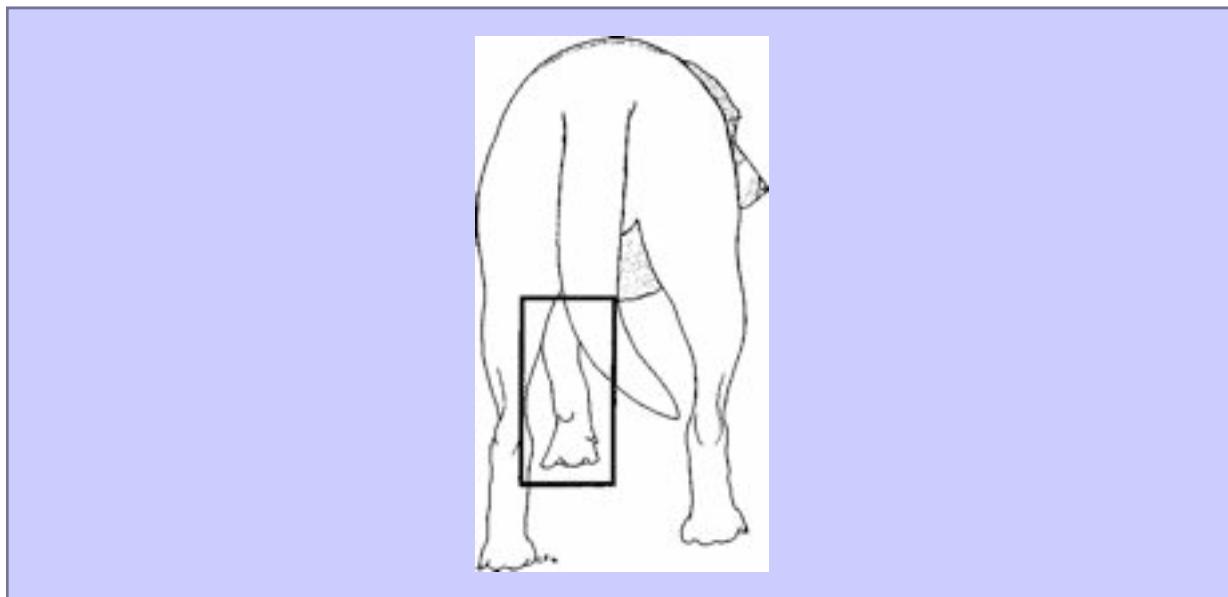
149 Palmar aspect of the manus of the left thoracic limb of a dog. The tendons of the superficial digital flexor have been dissected out as they course over the carpal region and into the manus. The carpal and metacarpal pads have been removed.



- 1 M. flexor digitorum superficialis
- 2 M. flexor carpi radialis
- 3 M. flexor carpi ulnaris (humeral head)
- 4 Tendon of M. flexor carpi ulnaris (ulnar head)
- 5 M. extensor carpi lateralis (M. ulnaris lateralis)
- 6 Carpal fascia (flexor retinaculum)
- 7 M. abductor digiti quinti
- 8 M. flexor digiti quinti
- 9 Fourth M. interosseus
- 10 Tendons of 1
- 11 One of the tendons of M. flexor digitorum profundus lying deep to 10
- 12 Palmar annular ligament (superficial transverse metacarpal ligament)
- 13 Proximal digital annular ligament
- 14 Mm. lumbricales
- 15 Position of proximal sesamoids
- 16 M. abductor pollicis brevis
- 17 Tendon of M. flexor digitorum profundus to first digit
- 18 Interdigital ligaments

150 Palmar aspect of the manus of the left thoracic limb of a dog. The tendons of the superficial digital flexor muscle have been reflected distally to reveal the tendons of the deep digital flexor muscle. The flexor retinaculum has been removed to show the deep digital flexor tendon running through the carpal canal.





- 1 Cut edge of the flexor retinaculum
- 2 Area of carpal canal
- 3 Tendon of the M. flexor digitorum profundus (cut proximally)
- 4 Mm. interossei
- 5 Tendon of M. flexor digitorum superficialis (reflected distally)

4.0.16 Clinical Note

- 1 The flexor retinaculum forms the palmar boundary of the carpal canal which in the dog and cat contains the structure 3 but not 5.

151 Palmar aspect of the manus of the left thoracic limb of a dog. The tendons of the superficial and deep digital flexor muscles have been cut and reflected distally to reveal the vacated carpal canal.



- 1 Tendon of the M. flexor digitorum superficialis (cut and reflected distally)
- 2 Tendon of the M. flexor digitorum profundus (cut and reflected distally)
- 3 Area of carpal canal
- 4 Palmar carpal fibrocartilage (palmar carpal ligament)
- 5 Accessory carpal bone
- 6 Remains of the cut synovial sheath of the tendon of M. flexor digitorum profundus

4.0.17

Clinical Note

- 4 This plate of fibrocartilage forms the dorsal boundary of the carpal canal.
- 5 This bone forms the lateral boundary of the carpal canal.

96

152 Axial section through the carpus and third digit of the manus of a dog.



- 1 Carpus
- 2 Third metacarpal bone
- 3 M. interosseus
- 4 Carpal pad
- 5 Tendon of M. flexor digitorum profundus
- 6 Metacarpophalangeal joint
- 7 Proximal sesamoid
- 8 Proximal phalanx
- 9 Tendon of M. flexor digitorum superficialis
- 10 Proximal interphalangeal joint
- 11 Middle phalanx
- 12 Distal interphalangeal joint
- 13 Claw
- 14 Ungual process of distal phalanx
- 15 Digital pad
- 16 Metacarpal pad
- 17 Dorsal sesamoid
- 18 Tendon of M. extensor digitorum communis
- 19 Dorsal elastic ligament

153 Mediolateral radiograph of an arteriogram of the thoracic limb of a dog.



- 1 Axillary artery
- 2 Branchial artery
- 3 Deep brachial artery
- 4 Bicipital artery
- 5 Colateral ulnar artery
- 6 Superficial branchial artery
- 7 Transverse cubital artery
- 8 Median artery
- 9 Recurrent ulnar artery
- 10 Common interosseous artery
- 11 Deep antebrachial artery
- 12 Radial artery
- 13 Caudal interosseous artery
- 14 Cranial interosseous artery
- 15 Ulnar artery
- 16 Palmar common digital arteries
- 17 Palmar metacarpal arteries
- 18 Palmar proper digital arteries

4.0.18 Clinical Note

- 7 This position where the flexor tendons pass over the palmar aspect of the proximal sesamoids is termed the proximal scutum.
- 9 The lower number 9 is placed where the tendon of the superficial digital flexor forms a tendinous sleeve (manica) to allow the tendon of the deep digital flexor to perforate through it. Immediately distal to the marker the superficial flexor tendon inserts onto the complimentary cartilage of the middle phalanx on the palmar aspect of the proximal interphalangeal joint. This latter cartilaginous structure forms the middle scutum for the flexor tendons.
- 12 The palmar aspect of the joint is crossed by the tendon of the deep digital flexor and is termed the distal scutum. In the dog a cartilaginous nodule is present in the tendon at this level.

154 Mediolateral (A) and craniocaudal dorsoplantar (B) radiographs of an arteriogram of the thoracic limb of a dog.



- 1 Brachial artery
- 2 Superficial brachial artery
- 3 Transverse cubital artery
- 4 Cranial superficial antebrachial artery
- 5 Median artery
- 6 Recurrent ulnar artery
- 7 Common interosseous artery
- 8 Caudal interosseous artery
- 9 Cranial interosseous artery
- 10 Ulnar artery
- 11 Radial artery
- 12 Anastomosis of the ulnar and caudal interosseous arteries
- 13 Radial palmar branch
- 14 Radial dorsal carpal branch
- 15 Palmar common digital arteries
- 16 Palmar metacarpal arteries
- 17 Palmar proper digital arteries
- 18 Dorsal proper digital arteries

155 Mediolateral radiograph of a venogram of the thoracic limb of a dog.



- 1 Accessory cephalic vein
- 2 Cephalic vein

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- 3 Radial vein
- 4 Interosseous vein
- 5 Ulnar vein
- 6 Median vein
- 7 Median cubital vein
- 8 Brachial vein
- 9 Axillobrachial vein
- 10 Omobrachial vein
- 11 Axillary vein
- 12 External jugular vein
- 13 Internal thoracic vein
- 14 Precava
- 15 Cranial vena cava
- 16 Right side of heart

99

156 A lateral aspect of the shoulder and brachium of the left thoracic limb of a cat.

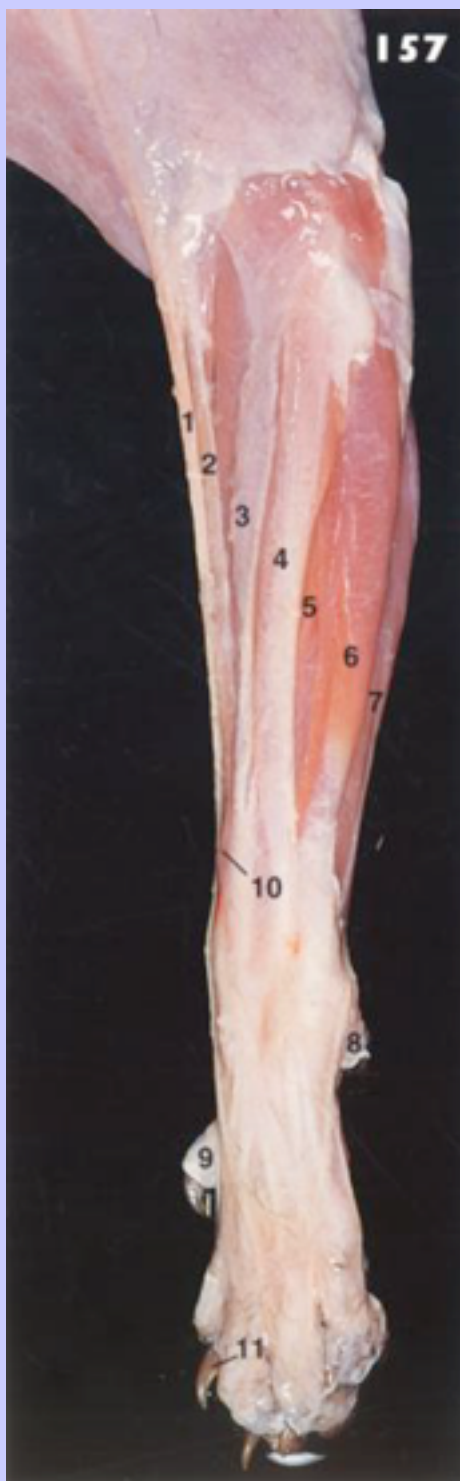
100



- 1 M. trapezius
- 2 M. latissimus dorsi
- 3 M. pectoralis profundus
- 4 M. obliquus externus abdominis
- 5 M. omotransversarius
- 6 M. cleidocephalicus, pars cervicalis (M. brachiocephalicus)
- 7 M. deltoideus
- 8 M. triceps brachii (lateral head)
- 9 M. triceps brachii (long head)
- 10 Acromion
- 11 Olecranon
- 12 Lateral epicondyle of humerus
- 13 Superficial cervical lymph nodes
- 14 M. serratus ventralis (situated deeply)
- 15 Scapula

100

157 Craniolateral aspect of the antebrachium and manus of the left thoracic limb of a cat.



- 1 Cephalic vein
- 2 M. brachioradialis
- 3 M. extensor carpi radialis
- 4 M. extensor digitorum communis
- 5 M. extensor digitorum lateralis
- 6 M. extensor carpi ulnaris (M. ulnaris lateralis)
- 7 M. flexor carpi ulnaris (ulnar head)
- 8 Carpal pad
- 9 First digit (dew claw)
- 10 M. abductor pollicis longus
- 11 Claw of third digit

158 Caudomedial aspect of the antebrachium and manus of the left thoracic limb of a cat.



- 1 Olecranon
- 2 Medial epicondyle
- 3 M. flexor carpi ulnaris (ulnar head)
- 4 M. flexor digitorum superficialis
- 5 M. flexor digitorum profundus (humeral head)
- 6 M. flexor carpi radialis
- 7 M. extensor carpi radialis
- 8 Cephalic vein
- 9 Carpal pad
- 10 First digit (dew claw)
- 11 Metacarpal pad
- 12 Digital pad of second digit

⁵ 5 THORAX

The osteological features of the thoracic region are revealed using bony specimens and radiographs. With prepared dissections, the musculature is serially displayed from the superficial to the deep layers to reveal the thoracic contents and to demonstrate the topography. The additional technique of B-mode ultrasonography is used to further illustrate cardiac anatomy, and cross-sectional specimens tie together the topographical relationships of the intrathoracic organs.

159 Lateral aspect of the first thoracic vertebra of a dog.



- 1 Spinous process
- 2 Lamina
- 3 Mamillary process
- 4 Caudal articular surface
- 5 Caudal costal fovea
- 6 Body
- 7 Cranial costal fovea
- 8 Costal fovea of transverse process

160 Craniolateral aspect of the sixth thoracic vertebra of a dog.



- 1 Spinous process
- 2 Lamina
- 3 Cranial articular surface
- 4 Transverse process
- 5 Costal fovea of 4
- 6 Pedicle
- 7 Body
- 8 Vertebral foramen
- 9 Cranial costal fovea

103

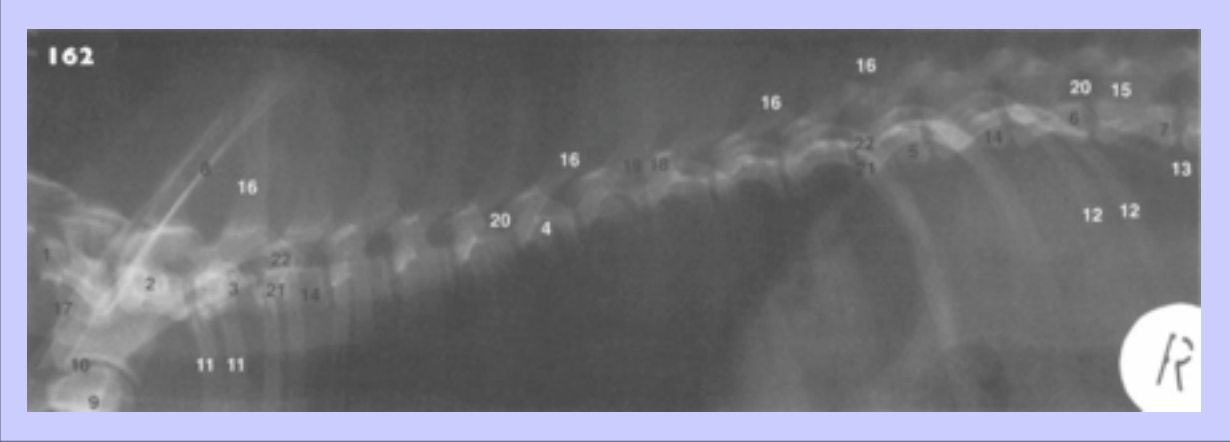
161 Lateral aspect of the articulated thoracic vertebrae of a dog.

104



- | | | |
|-------------------|------------------------------|-------------------------|
| 1 First | 6 Cranial articular process | 11 Cranial costal fovea |
| 2 Eleventh | 7 Mamillary process | 12 Caudal costal fovea |
| 3 Thirteenth | 8 Caudal articular process | 13 Anticlinal vertebra |
| 4 Body | 9 Transverse process | 14 Accessory process |
| 5 Spinous process | 10 Cranial costal fovea of 9 | 15 Intervention foramen |

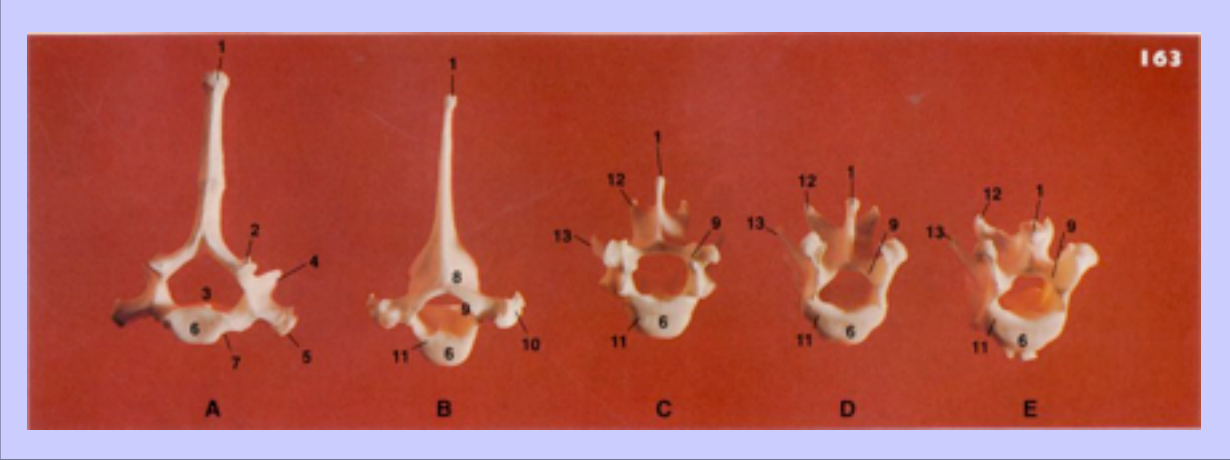
162 Radiograph of the lateral aspect of the thoracic portion of the vertebral column of a dog.



- | | | |
|---|--|--|
| 1 Sixth } cervical vertebra | 10 Shoulder joint | 17 Transverse process (plate-like lamina of sixth cervical vertebra) |
| 2 Seventh } cervical vertebra | 11 First } rib | 18 Cranial articular process |
| 3 First } thoracic vertebra | 12 Twelfth } rib | 19 Caudal articular process |
| 4 Sixth } thoracic vertebra | 13 Thirteenth (floating) } rib | 20 Intervertebral foramina |
| 5 Eleventh (anticlinal) } thoracic vertebra | 14 Body | 21 Head } of rib |
| 6 Thirteenth } thoracic vertebra | 15 Dorsal and ventral borders of vertebral foramen (vertebral canal) | 22 Tubercle } of rib |
| 7 First lumbar vertebra | 16 Spinous process | |
| 8 Scapula | | |
| 9 Humerus | | |

104
105

163 Caudal aspect of the first thoracic vertebra (A) and cranial aspect of the sixth (B), eleventh (C), twelfth (D) and thirteenth (E) thoracic vertebrae of a cat.

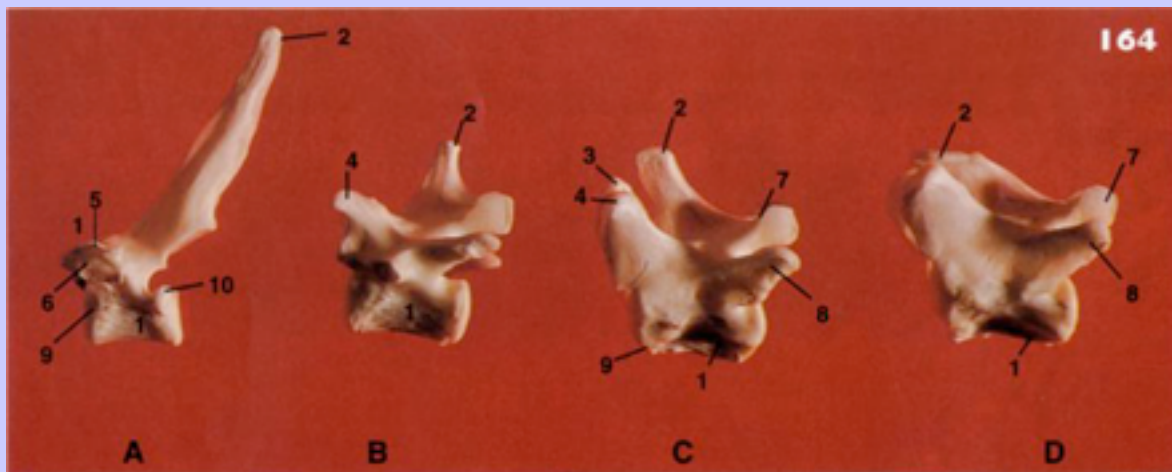


- 1 Spinous process

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- 2 Caudal articular surface
- 3 Vertebral foramen
- 4 Mamillary process
- 5 Transverse process (with cranial costal fovea)
- 6 Body
- 7 Caudal costal fovea
- 8 Lamina
- 9 Cranial articular surface
- 10 Transverse process
- 11 Cranial costal fovea
- 12 Caudal articular process
- 13 Accessory process

164 Left lateral aspect of the sixth (A), eleventh (anticlinal) (B), twelfth (C) and thirteenth (D) thoracic vertebrae of a cat.



- 1 Body
- 2 Spinous process
- 3 Cranial articular process

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- 4 Mamillary process
- 5 Transverse process
- 6 Costal fovea of 5
- 7 Caudal articular process
- 8 Accessory process
- 9 Cranial costal fovea
- 10 Caudal costal fovea

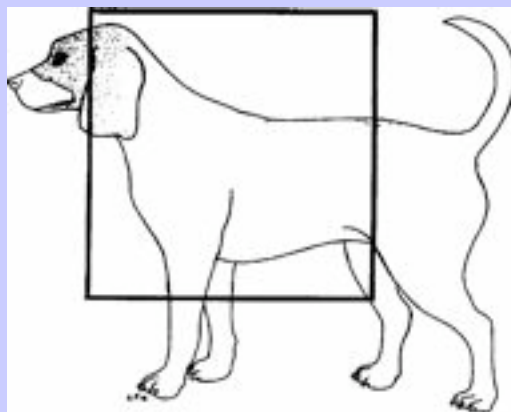
105

165 Lateral aspect of the superficial muscles of the shoulder and brachium of a dog. The cutaneous trunci and sphincter colli muscles have been removed.

106



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- 1 M. trapezius
- 2 M. latissimus dorsi
- 3 M. obliquus externus abdominis
- 4 M. rectus abdominis
- 5 Tendinous intersections
- 6 M. pectoralis profundus
- 7 M. triceps brachii (long head)
- 8 M. triceps brachii (lateral head)
- 9 Olecranon
- 10 Extensor group
- 11 Cephalic vein
- 12 Axillobrachial vein
- 13 M. cleidobrachialis
- 14 Greater tubercle of humerus
- 15 M. cleidocephalicus, pars cervicalis
- 16 M. sternocephalicus
- 17 M. supraspinatus
- 18 M. omotransversarius

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- 19 Acromion process
- 20 M. deltoideus
- 21 Scapular spine
- 22 Intercostobrachial nerve (second thoracic nerve)
- 23 Subscapular artery and vein
- 24 Superficial cervical lymph nodes

5.0.1

Clinical Note

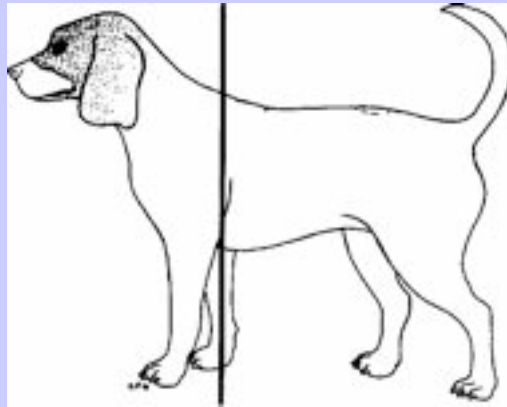
- 2 & 3** In a lateral approach to carry out a surgical thoracotomy the M. latissimus dorsi has to be transected across the direction of the muscle fibres. The underlying thoracodorsal nerve may be sectioned by this incision.
- 9** Note that the olecranon process lies opposite the level of the 5th rib in a standing dog. Thus in order to auscultate or carry out a cardiac ultrasound the limb has to be drawn cranially to examine at the 3rd and 4th intercostal spaces.
- 24** This lymph node is commonly palpated during routine clinical examination. It is the lymph node directly receiving drainage from the thoracic limb and thus enlargement of this node alone would indicate infection within the ipsilateral thoracic limb.

106

107

166 Lateral aspect of the muscles of the neck, thorax and abdominal wall of a dog. The left thoracic limb has been moved along with its extrinsic muscles. The axillary vessels and the brachial plexus have been sectioned in the process.





- 1 M. rhomboideus (cut)
- 2 M. splenius
- 3 M. longissimus cervicis
- 4 M. longissimus thoracis
- 5 M. spinalis and M. semispinalis thoracis
- 6 M. serratus dorsalis cranialis
- 7 Mm. intercostales
- 8 M. obliquus externus abdominis, pars costalis
- 9 M. obliquus externus abdominis, pars lumbalis
- 10 M. rectus abdominis
- 11 M. serratus ventralis (cut)
- 12 M. scalenus
- 13 M. rectus thoracis
- 14 Mm. pectorales (cut)
- 15 External jugular vein
- 16 Axillary vessels (cut)
- 17 M. serratus dorsalis caudalis
- 18 M. obliquus internus abdominis, pars costalis

5.0.2

Clinical Note

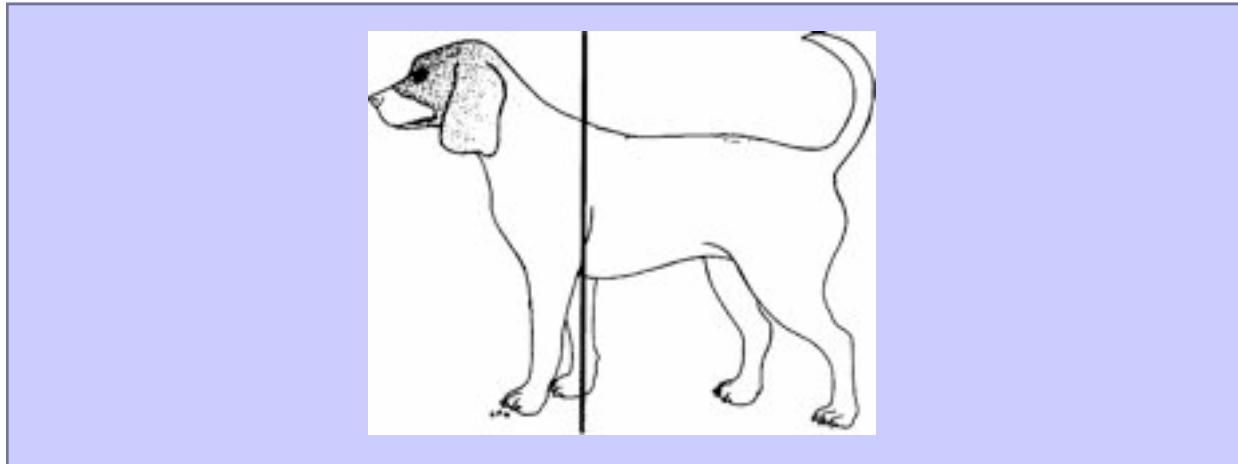
8 & 11 To achieve entry in to the thorax through an intercostal space during a thoracotomy these muscles have to be parted and held apart with rib retractors. This can be achieved relatively atraumatically by dividing between the pennate attachments to the ribs. Incisions cranial to the 5th intercostal space will necessitate sectioning the M. scalenus (12).

107

108

167 Caudal aspect of a transverse section through the trunk of a dog, at the level of the fourth thoracic vertebra.





- 1 M. trapezius
- 2 Supraspinous ligament
- 3 M. rhomboideus
- 4 Spinous process of fourth thoracic vertebra
- 5 M. spinalis and M. semispinalis (thoracis and cervicalis)
- 6 M. longissimus thoracis
- 7 M. multifidus thoracis
- 8 M. serratus dorsalis cranialis
- 9 M. iliocostalis thoracis
- 10 Mm. rotatores
- 11 Arch of fourth thoracic vertebra
- 12 Epidural fat
- 13 Spinal cord
- 14 Intercapital ligament
- 15 Head of rib (caput)
- 16 Mm. intercostales externi and interni
- 17 M. serratus ventralis
- 18 Scapula
- 19 M. latissimus dorsi
- 20 M. cutaneus trunci
- 21 M. scalenus
- 22 M. rectus abdominis
- 23 M. transversus thoracis
- 24 M. intercostalis internus
- 25 M. pectoralis profundus
- 26 Internal thoracic artery and vein
- 27 Sternum
- 28 Costal cartilage
- 29 Right ventricle
- 30 Left ventricle

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- 31 Pericardium overlying coronary vessels in fat of coronary groove
- 32 Right atrium
- 33 Left ventricular outflow tract (aortic valve)
- 34 Left auricle
- 35 Pulmonary artery (bifurcating)
- 36 Tracheobronchial lymph node
- 37 Aorta
- 38 Thoracic duct
- 39 Trachea
- 40 Oesophagus
- 41 Left and right vagus nerves
- 42 Right azygos vein
- 43 Pulmonary veins
- 44 Bronchi
- 45 M. longus colli
- 48 Sympathetic trunk
- 47 Annulus fibrosus } of intervertebral disc
- 48 Nucleus pulposus }
- 49 Cranial lobe of right lung
- 50 Cranial lobe of left lung
- 51 Phrenic nerve

5.0.3

Clinical Note

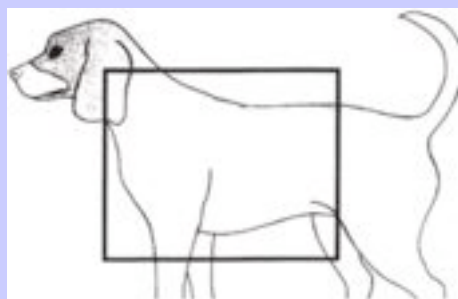
37 & 40 Note that at the level of the base of the heart, the aorta lies to the left of the oesophagus within the mediastinal space. Thus if surgical access to the oesophagus is sought by performing a thoracotomy it is best performed from the right side, to avoid the aorta. In the caudal mediastinal space the oesophagus lies to the left but the aorta is now dorsal and so the surgical approach is performed from the left.

108

168 Lateral aspect of the left thorax of a dog. The muscles of the thoracic wall and thoracic limb have been resectedw, along with alternate ribs.



- 1 M. serratus dorsalis cranialis
 - 2 Brachial plexus
 - 3 Axillary vessels
 - 4 First
 - 5 Third
 - 6 Fifth
 - 7 Thirteenth (floating))
 - 8 Pars sternalis
 - 9 Pars costalis
 - 10 Centrum tendineum
 - 11 Left costodiaphragmatic recess
 - 12 M. obliquus externus abdominis
 - 13 Heart
 - 14 Mediastinal pleura
 - 15 Caudal lobe
 - 16 Caudal part of cranial lobe
 - 17 Cranial part of cranial lobe
 - 18 Thymus
 - 19 Costochondral joints
 - 20 Costal cartilages
 - 21 Sternum
 - 22 Costal arch
- } rib
- } of diaphragm
- } of left lung



5.0.4

Clinical Note

13 Note that the heart is visible in this position of 3rd, 4th and 5th intercostal space. This aperture in the border of the lung is termed the cardiac notch. It is significant as a window for examination for the purpose of auscultation and echocardiography as there is direct access to the heart without overlying lung field. There is a similar cardiac notch on the right side (see [Fig. 169, 15](#)).

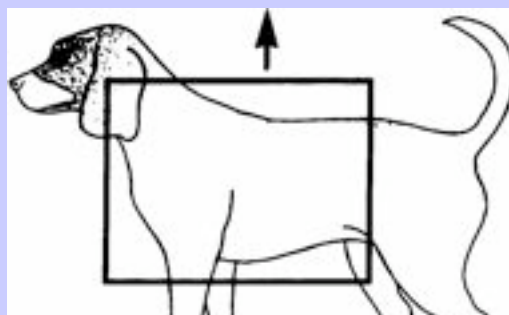
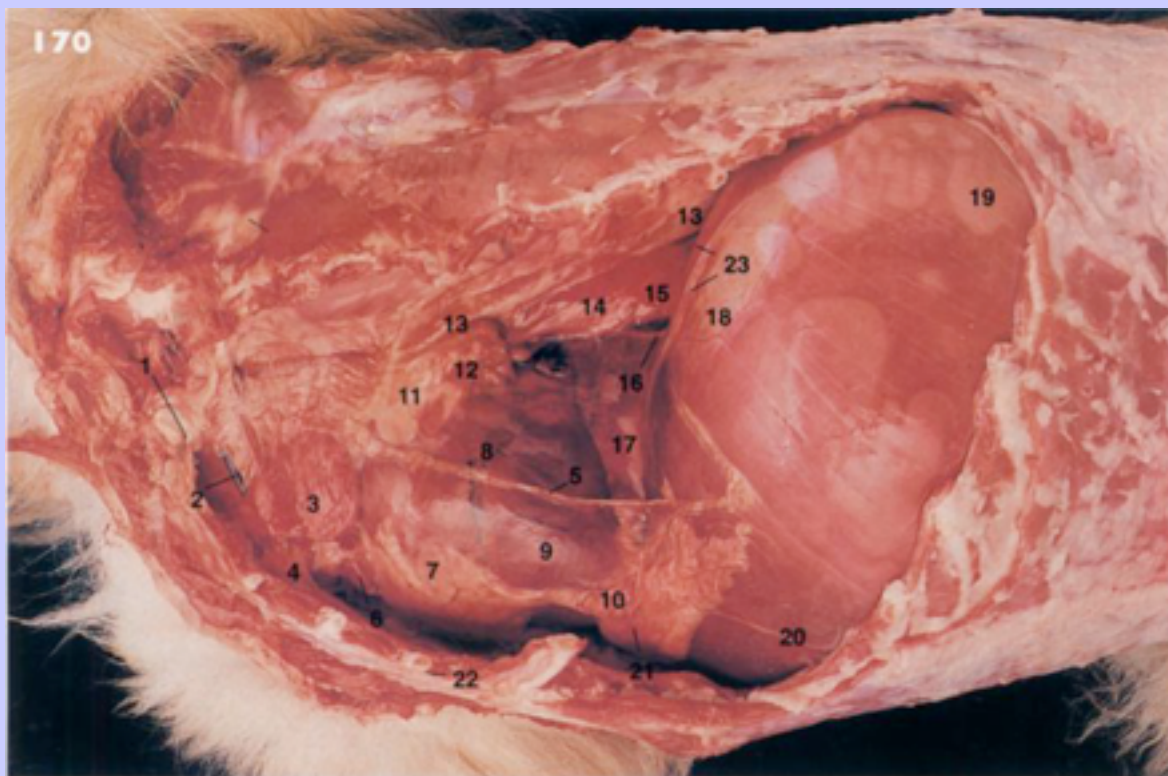
169 Lateral aspect of the opened right thorax of a dog. The right thoracic wall and thoracic limb have been removed, along with alternate ribs.

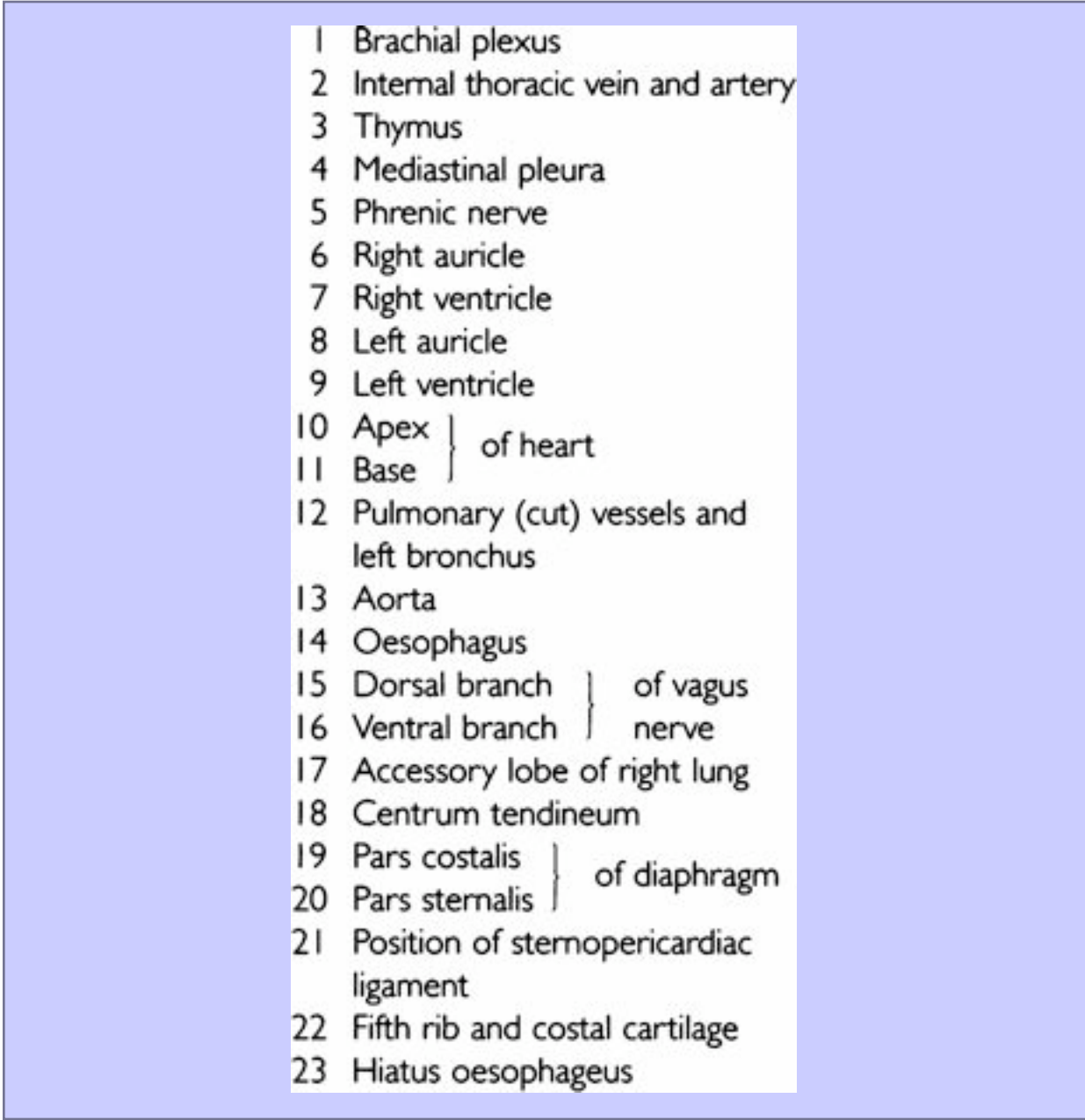


- 1 M. serratus dorsalis cranialis
 - 2 Brachial plexus
 - 3 Axillary vessels
 - 4 First
 - 5 Third
 - 6 Fifth
 - 7 Thirteenth (floating))
 - 8 Pars sternalis
 - 9 Pars costalis
 - 10 Centrum tendineum
 - 11 Left costodiaphragmatic recess
 - 12 M. obliquus externus abdominis
 - 13 Heart
 - 14 Mediastinal pleura
 - 15 Caudal lobe
 - 16 Caudal part of cranial lobe
 - 17 Cranial part of cranial lobe
 - 18 Thymus
 - 19 Costochondral joints
 - 20 Costal cartilages
 - 21 Sternum
 - 22 Costal arch
- } rib
- } of diaphragm
- } of
left
lung



170 Lateral aspect of the opened left thorax of a dog. The left lung has been resected to expose the mediastinum and its contents.



- 
- 1 Brachial plexus
 - 2 Internal thoracic vein and artery
 - 3 Thymus
 - 4 Mediastinal pleura
 - 5 Phrenic nerve
 - 6 Right auricle
 - 7 Right ventricle
 - 8 Left auricle
 - 9 Left ventricle
 - 10 Apex } of heart
 - 11 Base }
 - 12 Pulmonary (cut) vessels and left bronchus
 - 13 Aorta
 - 14 Oesophagus
 - 15 Dorsal branch } of vagus
 - 16 Ventral branch } nerve
 - 17 Accessory lobe of right lung
 - 18 Centrum tendineum
 - 19 Pars costalis } of diaphragm
 - 20 Pars sternalis }
 - 21 Position of sternopericardiac ligament
 - 22 Fifth rib and costal cartilage
 - 23 Hiatus oesophageus

5.0.5 Clinical Note ([Fig. 170](#))

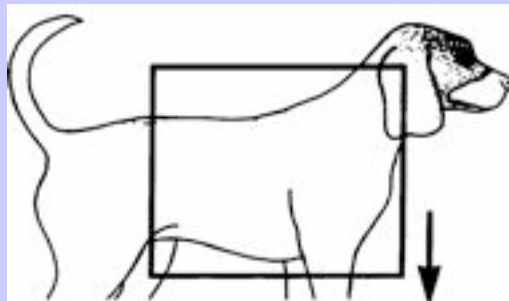
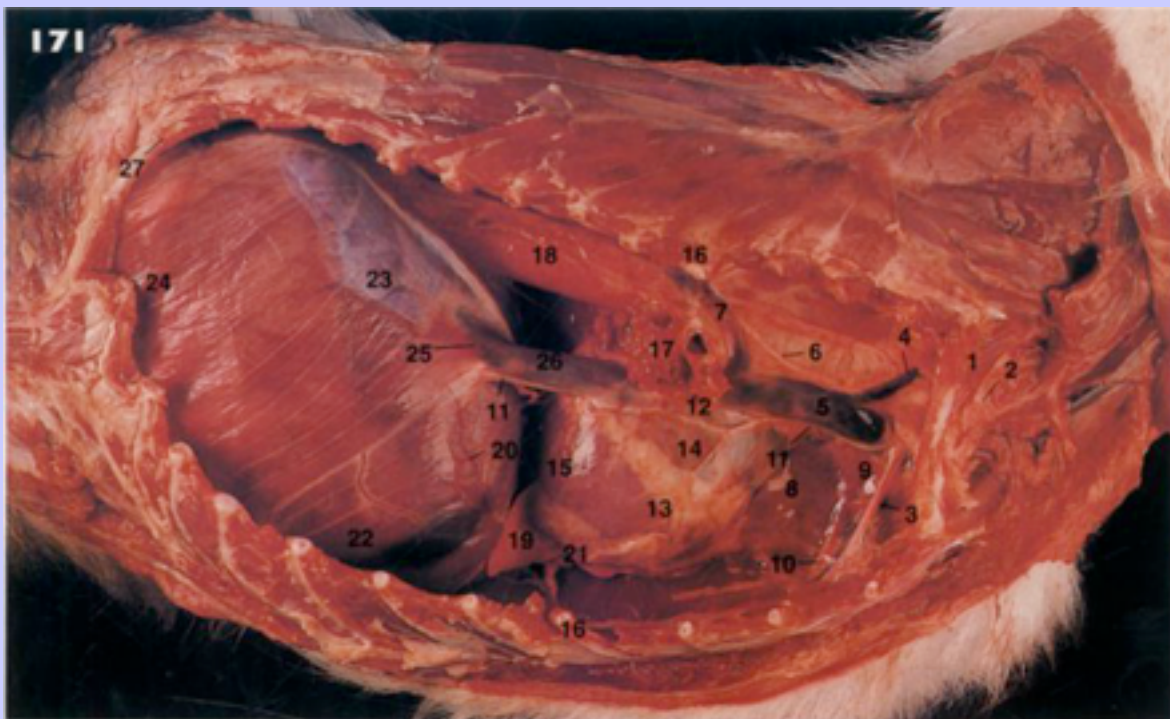
- 3 The thymus is large in this dog indicating that it is an active organ of an immature animal. As the dog matures the organ declines in activity and thus in size. An older dog would have a small, less obvious organ.


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14, 15 & 16 Note the position of the oesophagus as it lies in the caudal mediastinum. This is a common sight for obstruction of the oesophagus by a foreign body and care should be taken when incising the oesophagus to preserve the vagal nerve branches as they lie on the surface of the organ.

23 The hiatus oesophageus is a natural passageway through the diaphragm between the abdominal and thoracic cavities. It is a potential sight for herniation of the diaphragm and may have to be repaired surgically from a left-side thoracotomy incision.

171 Lateral aspect of the opened right thorax of a dog. The right lung has been resected to expose the mediastinum and its contents.

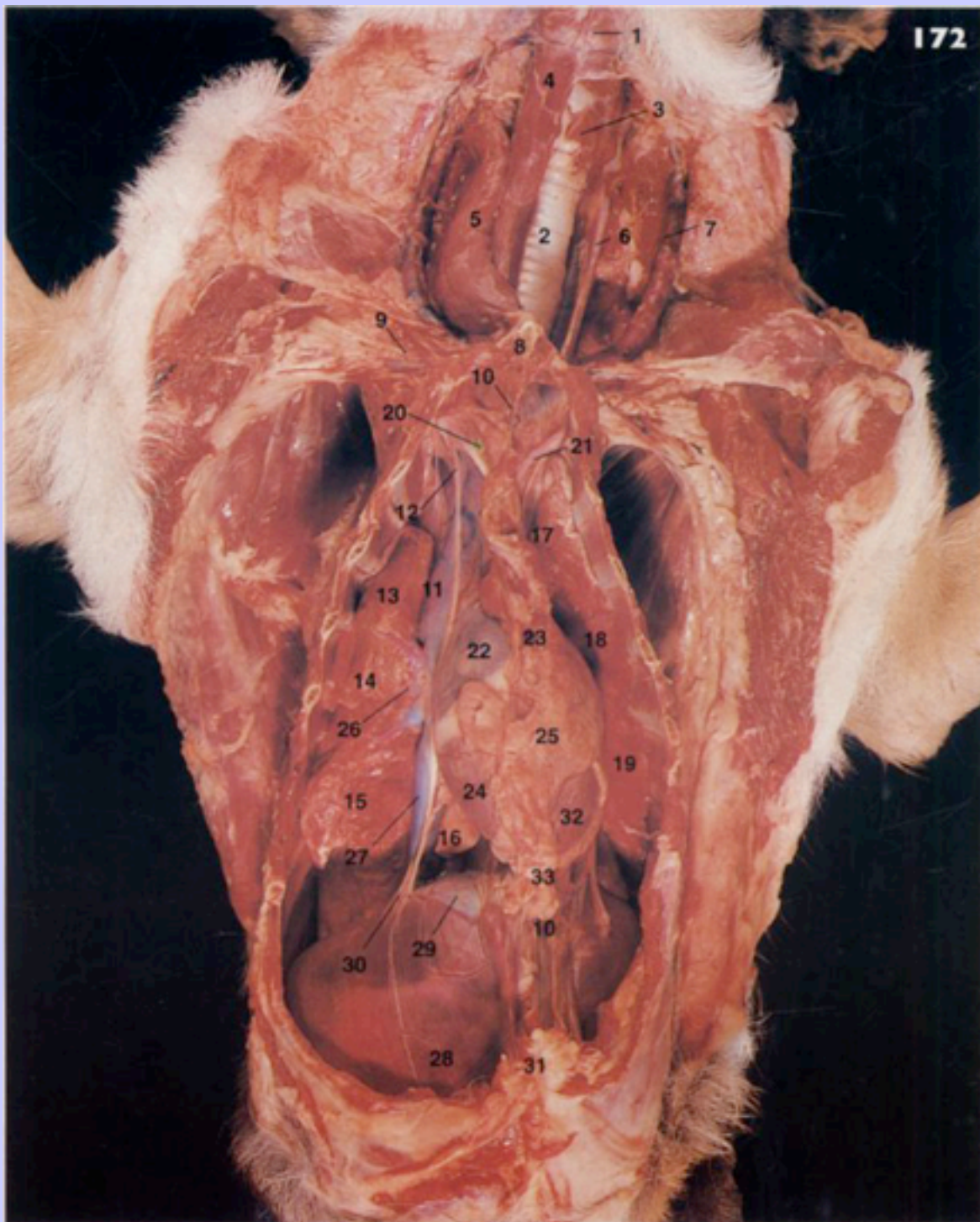


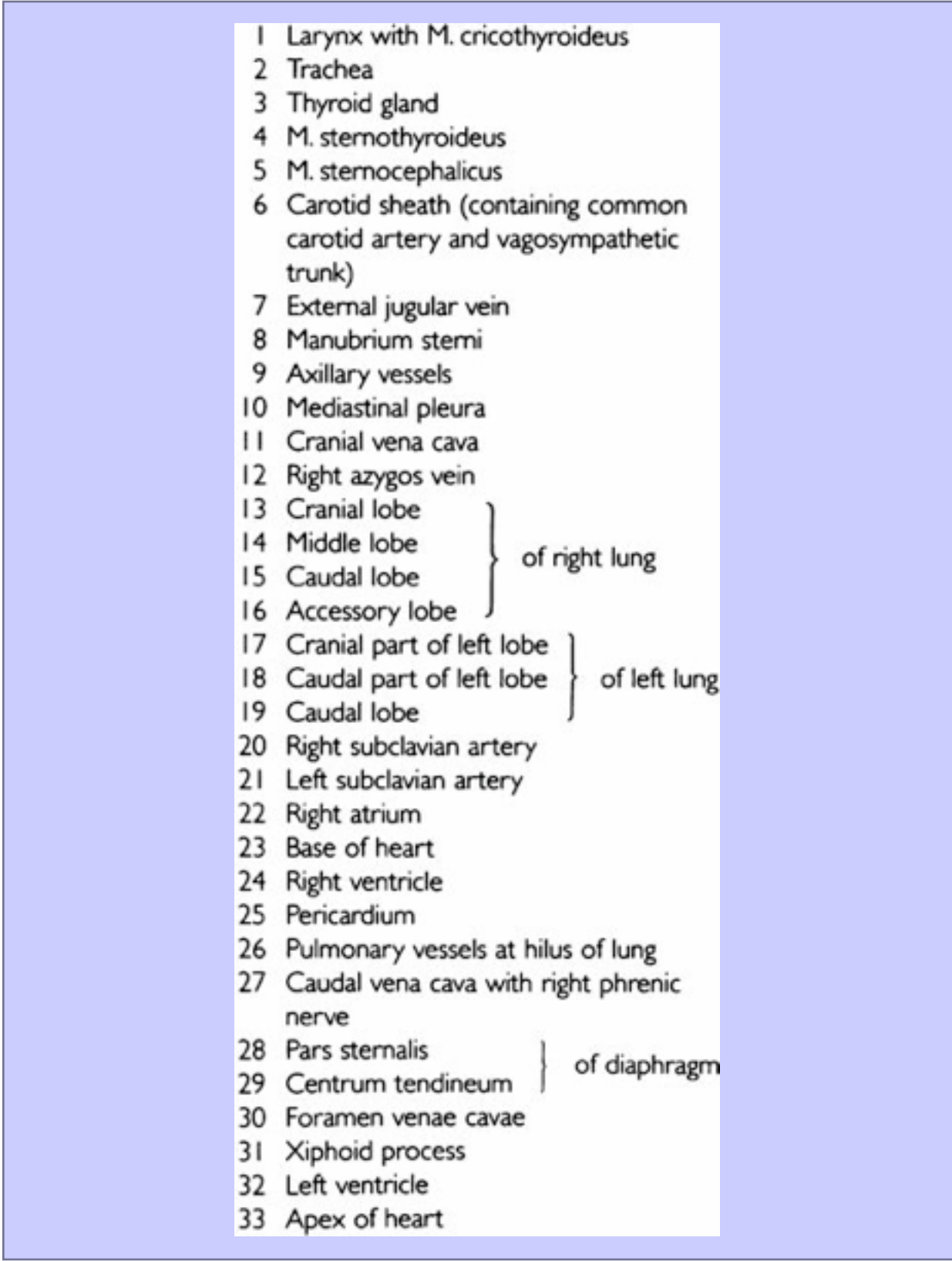
- 
- 1 First rib
2 Brachial plexus
3 Internal thoracic artery and vein
4 Right costocervical vein
5 Cranial vena cava
6 Vagus nerve (crossing trachea)
7 Right azygos vein
8 Cranial lobe of left lung
9 Thymus
10 Mediastinal pleura
11 Right phrenic nerve
12 Base of heart
13 Right ventricle
14 Right atrium
15 Left ventricle
16 Fifth rib
17 Pulmonary vessels (cut) and
bronchus
18 Oesophagus with vagus nerve
19 Left lung
20 Plica venae cavae
21 Apex of heart
22 Pars sternalis
23 Centrum tendineum
24 Pars costalis
25 Foramen venae cavae
26 Caudal vena cava
27 Thirteenth (floating) rib
- 22, 23, 24 } of diaphragm

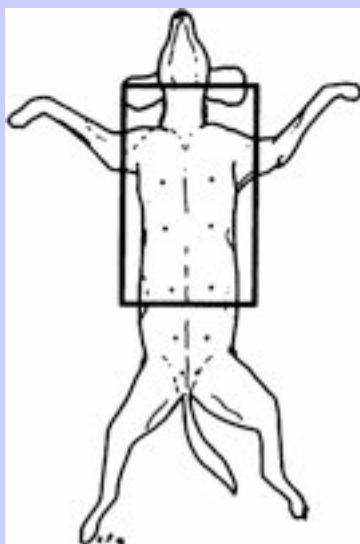
110

172 Ventral aspect of the opened thorax of a dog. The sternum and costal cartilages have been removed to reveal the thoracic viscera.

111



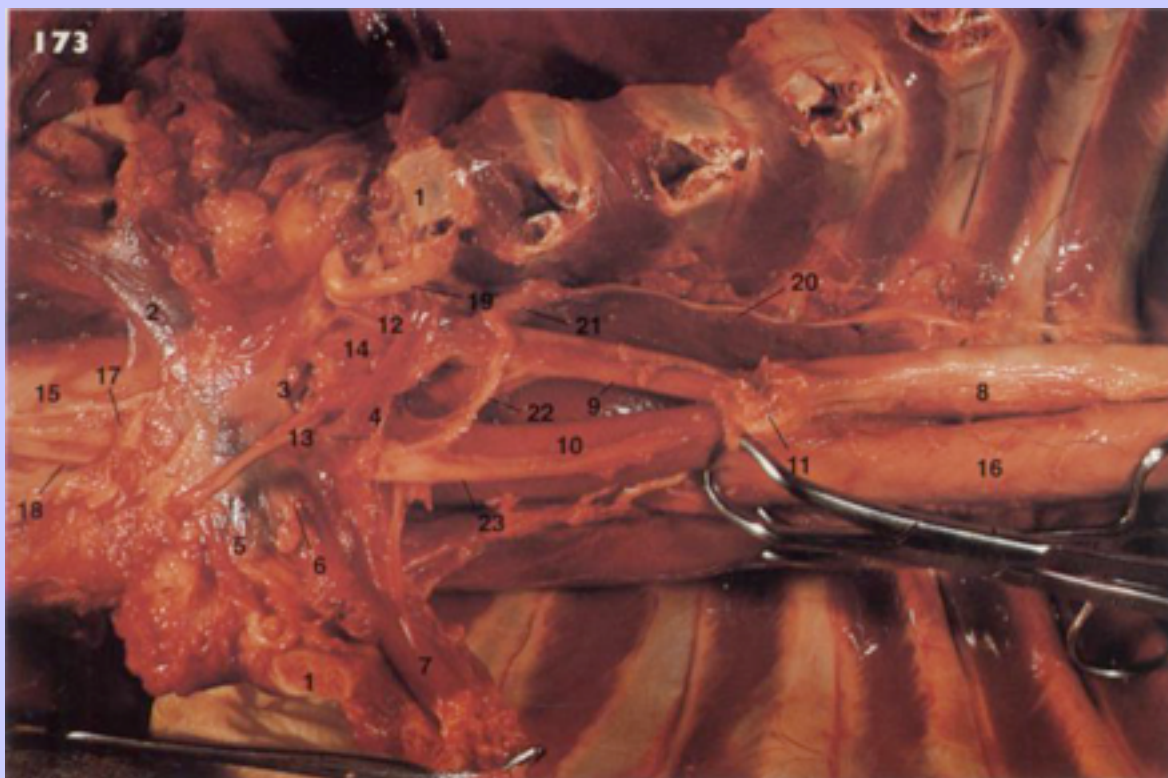
- 
- 1 Larynx with M. cricothyroideus
 - 2 Trachea
 - 3 Thyroid gland
 - 4 M. sternothyroideus
 - 5 M. sternocephalicus
 - 6 Carotid sheath (containing common carotid artery and vagosympathetic trunk)
 - 7 External jugular vein
 - 8 Manubrium sterni
 - 9 Axillary vessels
 - 10 Mediastinal pleura
 - 11 Cranial vena cava
 - 12 Right azygos vein
 - 13 Cranial lobe
 - 14 Middle lobe
 - 15 Caudal lobe
 - 16 Accessory lobe
 - 17 Cranial part of left lobe
 - 18 Caudal part of left lobe
 - 19 Caudal lobe
 - 20 Right subclavian artery
 - 21 Left subclavian artery
 - 22 Right atrium
 - 23 Base of heart
 - 24 Right ventricle
 - 25 Pericardium
 - 26 Pulmonary vessels at hilus of lung
 - 27 Caudal vena cava with right phrenic nerve
 - 28 Pars sternalis
 - 29 Centrum tendineum
 - 30 Foramen venae cavae
 - 31 Xiphoid process
 - 32 Left ventricle
 - 33 Apex of heart

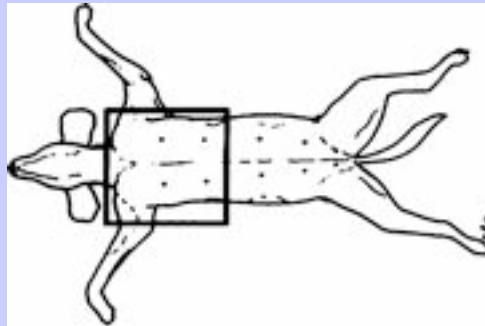


111

173 Exposure of the dorsocranial region of the thorax of a dog. The thoracic viscera have been resected by severing the aortic arch and the venae cavae at the base of the heart.

112



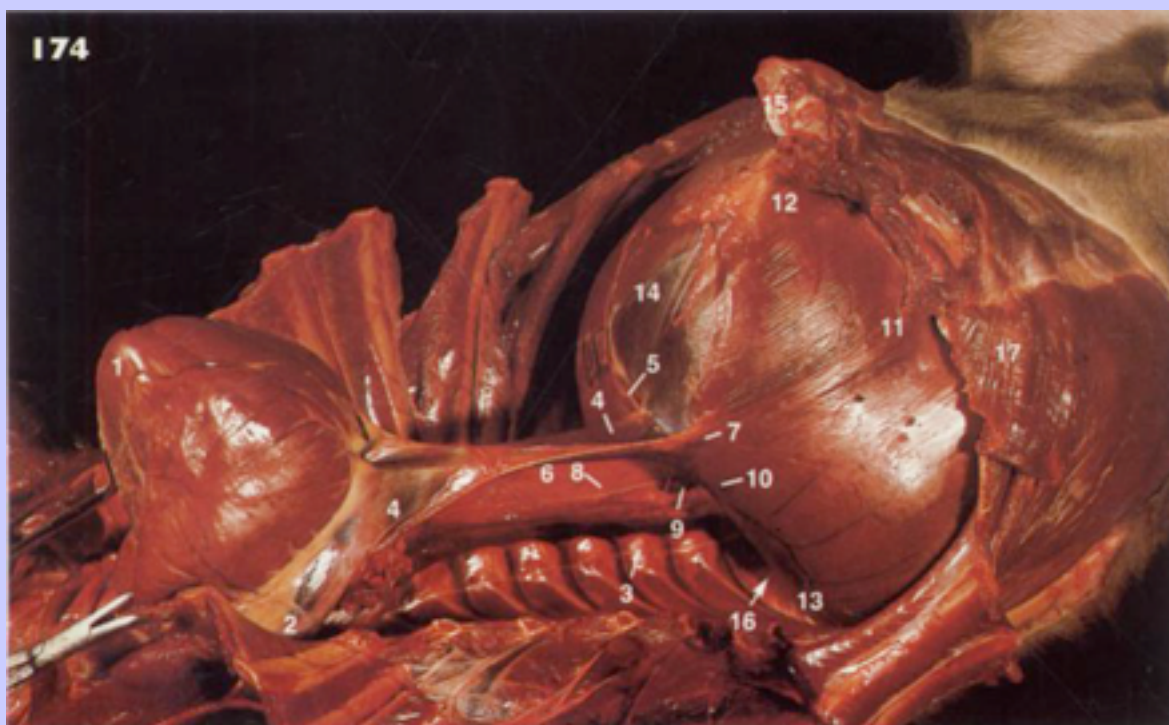


- 1 First rib
- 2 Left brachiocephalic vein
- 3 Left subclavian vein
- 4 Left costocervical vein
- 5 Right brachiocephalic vein
- 6 Internal thoracic vein (cut)
- 7 Cranial vena cava (cut with artery forceps)
- 8 Descending aorta
- 9 Left subclavian artery
- 10 Brachiocephalic artery
- 11 Proximal end of aortic arch (cut)
- 12 Costocervical trunk
- 13 Internal thoracic artery
- 14 Continuation of subclavian artery to become axillary artery
- 15 Cervical oesophagus
- 16 Thoracic oesophagus
- 17 Recurrent laryngeal nerve
- 18 Carotid sheath (containing common carotid artery and vagosympathetic trunk)
- 19 Vertebral nerve

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- 20 Sympathetic trunk or chain
- 21 Cervicothoracic ganglion (stellate)
- 22 Ansa subclavia
- 23 Left vagus nerve (cut)

174 Cranial aspect of the diaphragm of a dog, viewed from the right. The lungs have been removed and the heart displaced caudally.



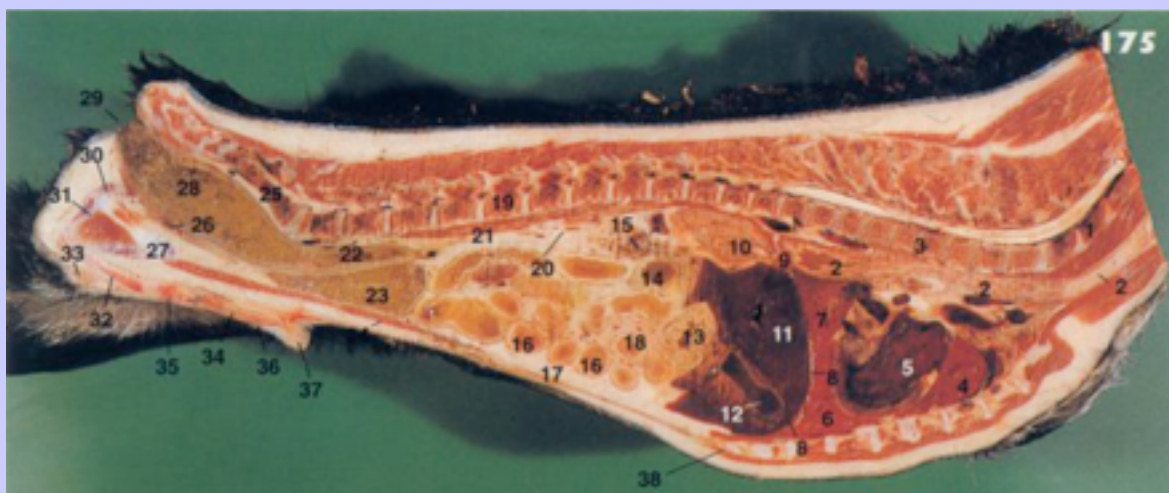
- 1 Apex of heart
- 2 Cranial vena cava
- 3 Sympathetic trunk
- 4 Caudal vena cava
- 5 Foramen venae cavae
- 6 Oesophagus
- 7 Hiatus oesophageus
- 8 Vagus nerve
- 9 Aorta
- 10 Hiatus aorticus
- 11 Pars costalis
- 12 Pars sternalis
- 13 Pars lumbalis
- 14 Centrum tendineum
- 15 Xiphoid process
- 16 Recessus phrenicolumbalis
- 17 M. serratus ventralis

of
diaphragm

112

113

175 Paramedian section through the thoracic, abdominal and pelvic cavities of a male dog, showing the topography of the structures of the left side.



- 1 Cervical vertebrae
- 2 Oesophagus
- 3 Thoracic vertebrae
- 4 Cranial lobe of left lung
- 5 Right ventricle
- 6 Accessory lobe of right lung
- 7 Caudal lobe of left lung
- 8 Diaphragm
- 9 Hiatus oesophageus
- 10 Cardiac region of stomach
- 11 Liver
- 12 Gall bladder
- 13 Pyloric region of stomach
- 14 Transverse colon
- 15 Pancreas
- 16 Jejunum
- 17 Greater omentum
- 18 Great mesentery
- 19 Lumbar vertebrae
- 20 Aorta
- 21 M. psoas major
- 22 Descending colon
- 23 Urinary bladder
- 24 M. rectus abdominis
- 25 Sacrum
- 26 Prostate

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- 27 Symphysis pelvis
- 28 Rectum
- 29 Anus
- 30 Root of penis
- 31 Corpus cavernosum penis
- 32 Body of penis
- 33 Testis
- 34 Glans penis
- 35 Bulbus glandis
- 36 Pars longa glandis
- 37 Prepuce
- 38 Xiphoid process of sternum

176 Paramedian section through the thoracic, abdominal and pelvic cavities of a male dog, showing the topography of the structures of the right side.



- 1 Cervical vertebrae
- 2 Spinal cord
- 3 Trachea

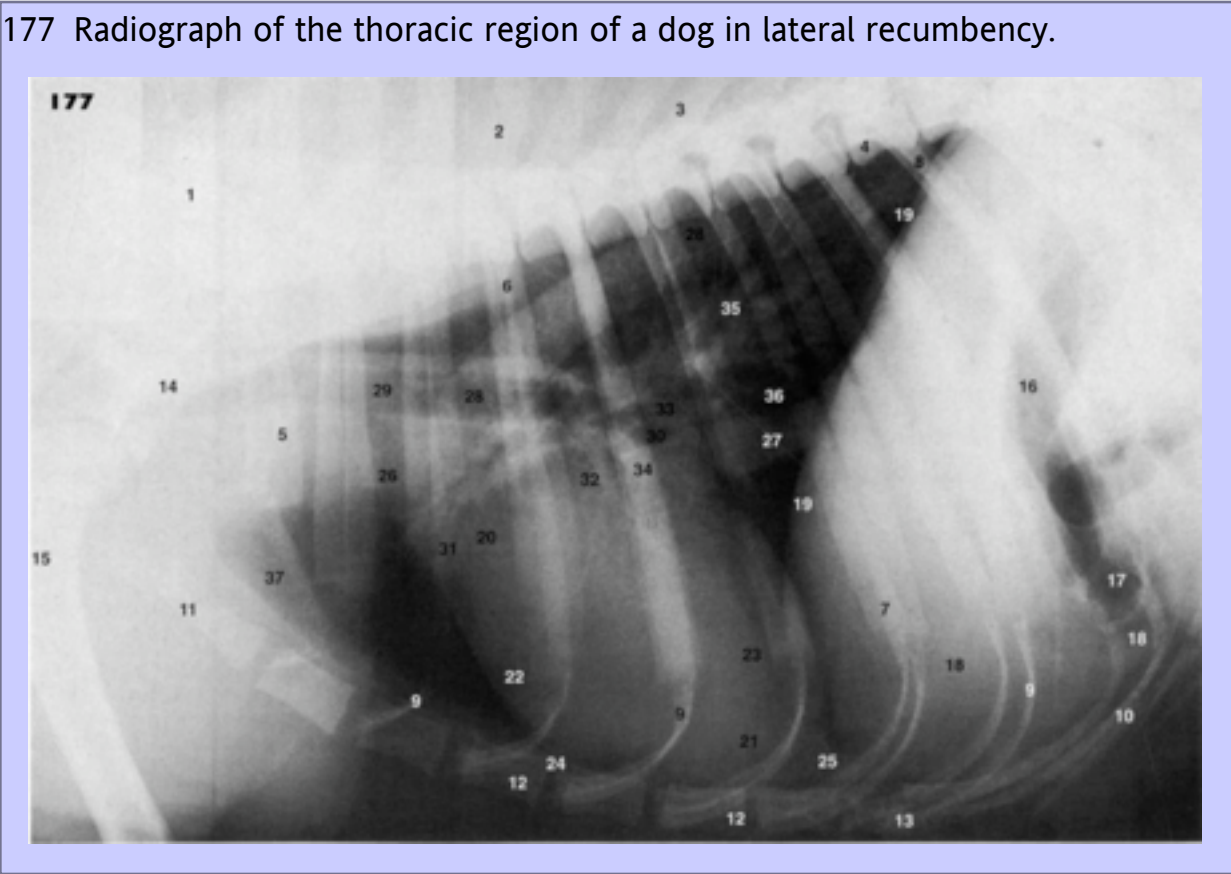
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- 4 Thoracic vertebrae
- 5 Manubrium sterni
- 6 Oesophagus
- 7 Cranial vena cava
- 8 Right ventricle
- 9 Diaphragm
- 10 Liver
- 11 Gall bladder
- 12 Stomach
- 13 Lumbar vertebrae
- 14 Mesenteric lymph node
- 15 Transverse duodenum
- 16 Urinary bladder
- 17 Descending colon
- 18 Rectum
- 19 Sacrum
- 20 Caudal vertebrae
- 21 Symphysis of pubis

113

177 Radiograph of the thoracic region of a dog in lateral recumbency.

114



1 First	} thoracic vertebra	14 Scapula	27 Caudal vena cava
2 Fourth		15 Humerus	28 Aorta
3 Seventh		16 Stomach	29 Trachea
4 Tenth		17 Small Intestine	30 Tracheal bifurcation
5 First	} rib	18 Liver	31 Bronchus to cranial
6 Fourth		19 Diaphragm	32 Bronchus to middle
7 Seventh		20 Base	33 Bronchus to caudal
8 Tenth		21 Apex	34 Bronchus to accessory lobe of
9 Costal cartilage		22 Right side	right lung
10 Costal arch		23 Left side	35 Dorsal bronchi
11 Manubrium sterni		24 Pericardium	36 Ventral bronchi
12 Sternebrae		25 Sternopericardiac ligament	37 Pleural cupula
13 Xiphoid process		26 Cranial vena cava	

114

178 Ventrodorsal radiograph of the thoracic region of a dog.



- 1 Seventh cervical vertebra
- 2 First }
- 3 Fourth } thoracic
- 4 Seventh } vertebra
- 5 Tenth }
- 6 First }
- 7 Fourth } rib
- 8 Seventh }
- 9 Tenth }
- 10 Sternebra
- 11 Scapula
- 12 Trachea
- 13 Base }
- 14 Apex } of heart
- 15 Aorta
- 16 Cranial vena cava
- 17 Caudal vena cava
- 18 Sternopericardiac ligament
- 19 Right lung
- 20 Left lung
- 21 Pleural cupula
- 22 Diaphragm
- 23 Liver
- 24 Stomach
- 25 Cranial articular }
- process }
- 26 Caudal articular } of
- process } vertebra
- 27 Spinous process
- 28 Costal fovea
- 29 Body
- 30 Head of rib
- 31 Costal cartilage

179 Lateral radiograph of a kitten, showing the skeletal elements and centres of ossification.

116



- 1 Frontal sinus
- 2 Maxilla
- 3 Tympanic bulla
- 4 Clavicle
- 5 Supramammary process on acromion of scapula
- 6 Heart
- 7 Diaphragm

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8 Descending colon

5.0.6

Clinical Note

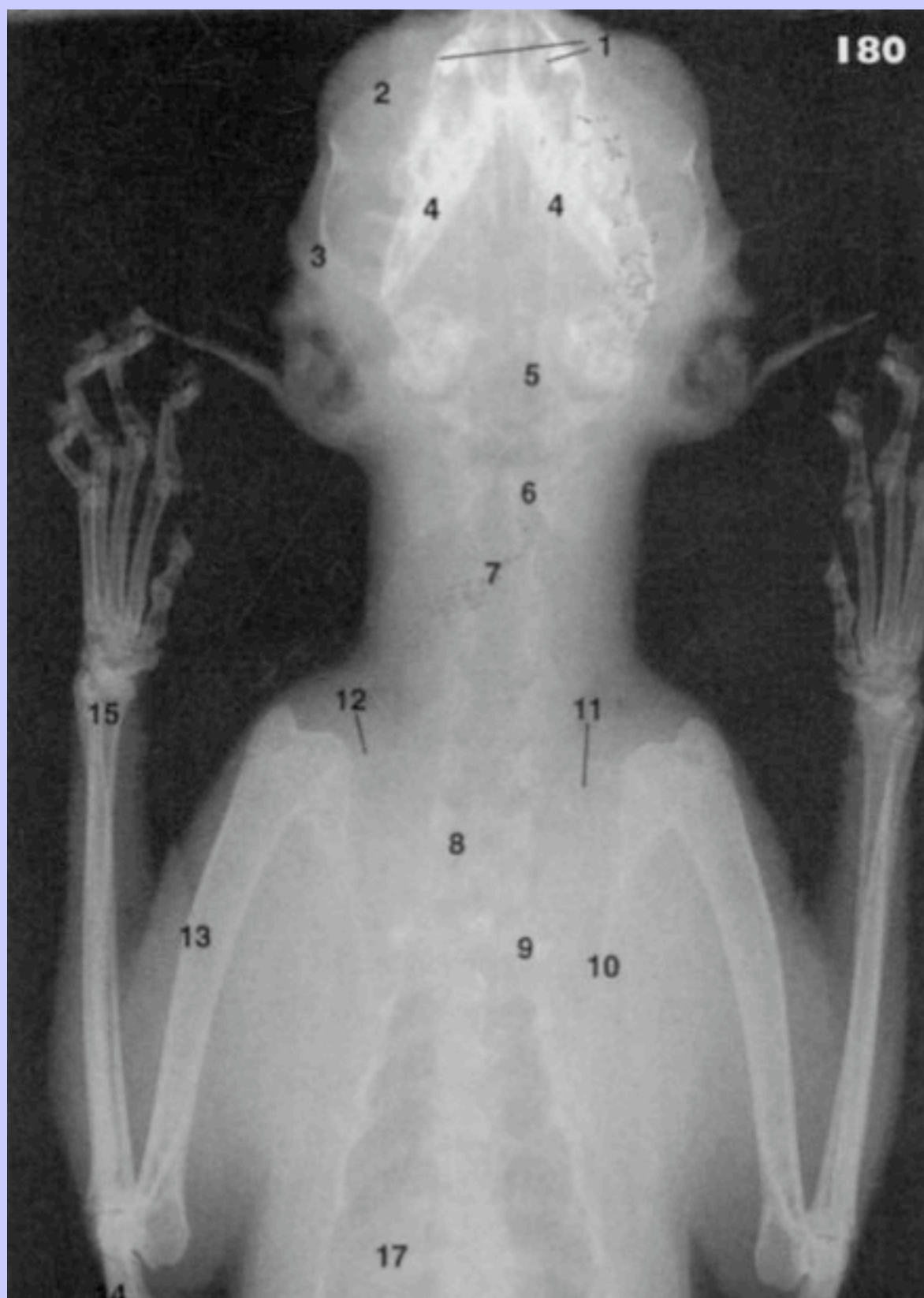
4 & 5 The clavicle and the supramate process are not found in the dog.

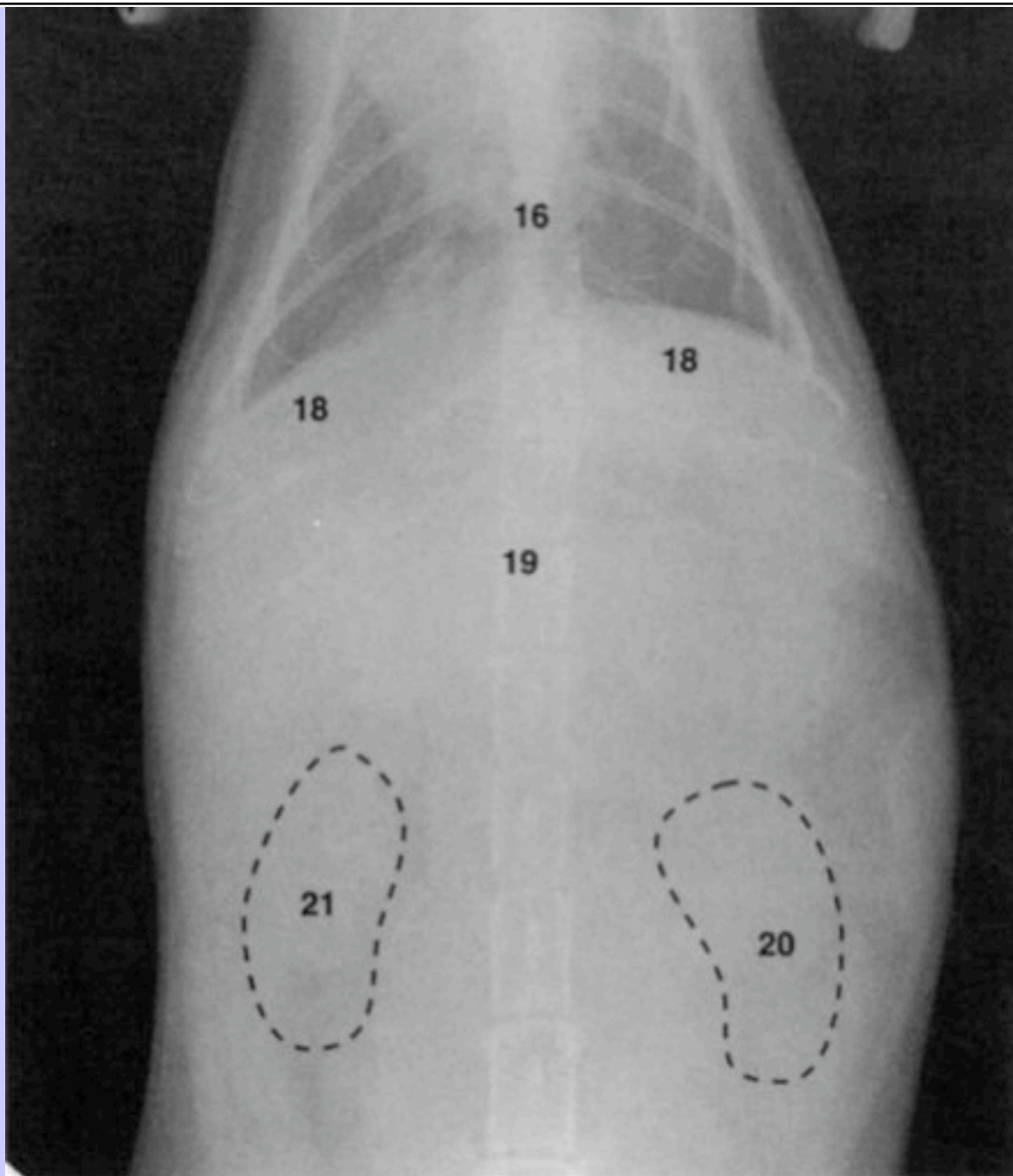
Note the foreshortened facial region of the skull

116

180 Dorsoventral radiograph of the head, neck and thorax of a cat.

117





- | | |
|-----------------------------------|--------------------------|
| 1 Canine teeth | 11 Suprahyoid process |
| 2 Maxilla | 12 Clavicle |
| 3 Zygomatic arch | 13 Humerus |
| 4 Mandible | 14 Olecranon of ulna |
| 5 Tympanic bulla | 15 Radius |
| 6 First cervical vertebra (atlas) | 16 Apex } of heart |
| 7 Second cervical vertebra (axis) | 17 Base } |
| 8 Manubrium sterni | 18 Diaphragm |
| 9 First rib | 19 First lumbar vertebra |
| 10 Scapula | 20 Left } renal outline |
| | 21 Right } |

117

181 Cross section through the ventricles of a dog heart.

118

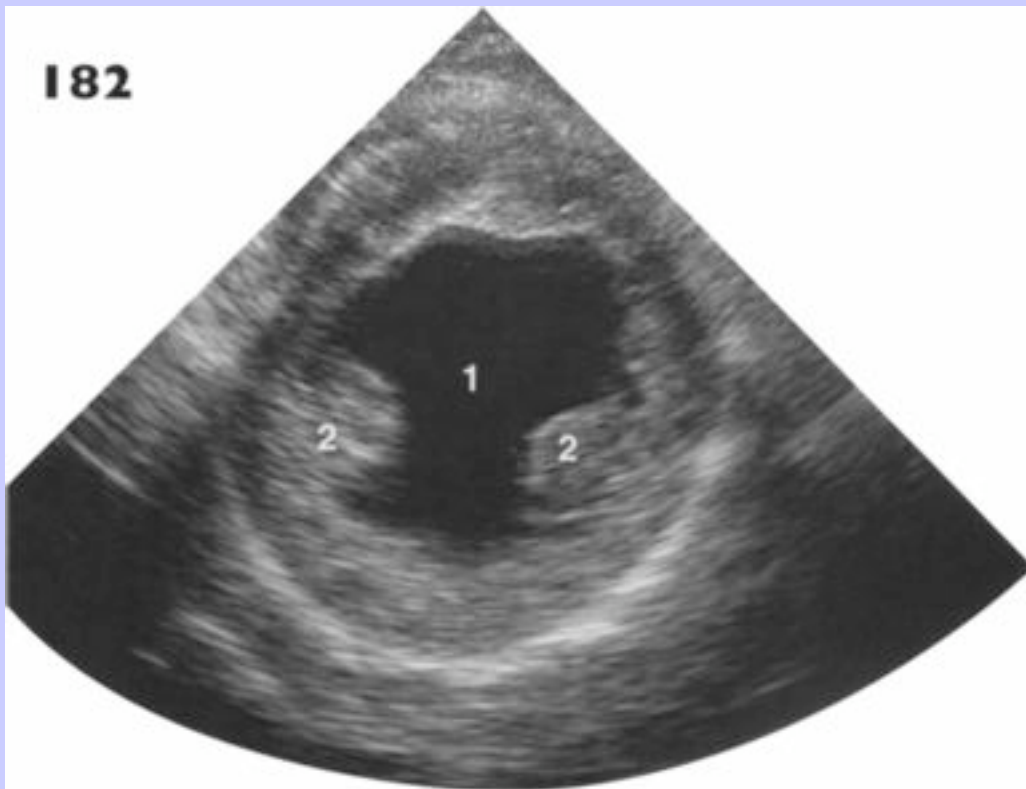


- | | | |
|---------------------------|---|--------------------|
| 1 Lumen | } | of right ventricle |
| 2 Free wall | | |
| 3 Interventricular septum | | |
| 4 Lumen | } | of left ventricle |
| 5 Free wall | | |
| 6 Papillary muscles | | |

5.0.7 **Clinical Note**

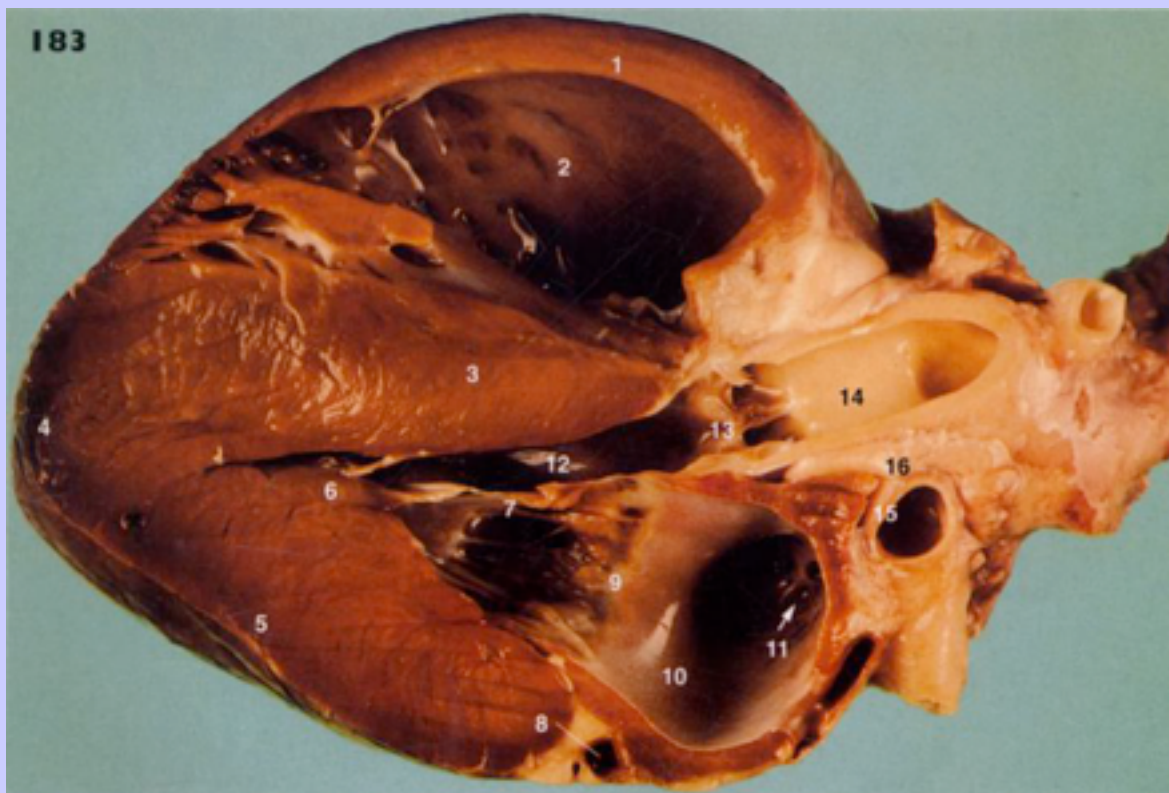
This section through the ventricles gives an anatomical plane similar to that in a short-axis ultrasound scan. It is the preferred position for measuring ventricular dimensions with M-mode ultrasonography.

182 Ultrasound scan of a short-axis cross section through the left ventricle of the heart of a dog. The papillary muscles are seen at the periphery of the ventricle.



- 1 Left ventricle
- 2 Papillary muscles

183 Longitudinal section of the heart of a dog, showing the intracardiac structures seen on long-axis ultrasound scans.

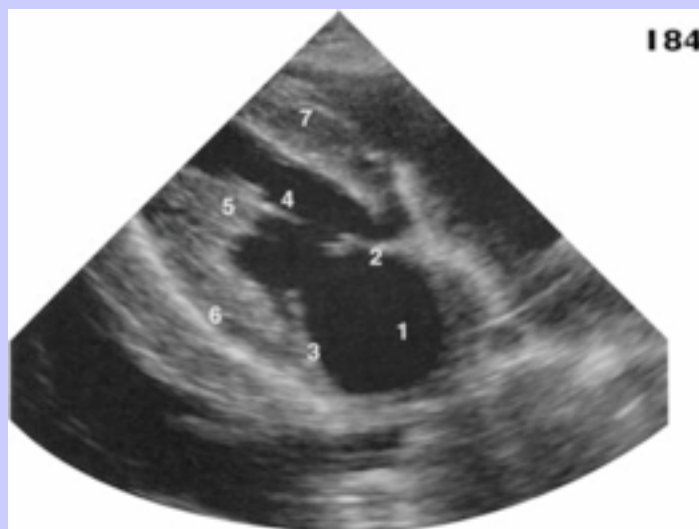


- 1 Free wall } of right
- 2 Lumen } ventricle
- 3 Interventricular septum
- 4 Apex of heart
- 5 Free wall of left ventricle
- 6 Papillary muscle
- 7 Chordae tendineae
- 8 Coronary vessels
- 9 Mitral (left atrioventricular)
valve
- 10 Left atrium
- 11 Left auricle
- 12 Outflow tract of left
ventricle
- 13 Aortic valve
- 14 Aorta
- 15 Pulmonary artery
- 16 Base of heart

118

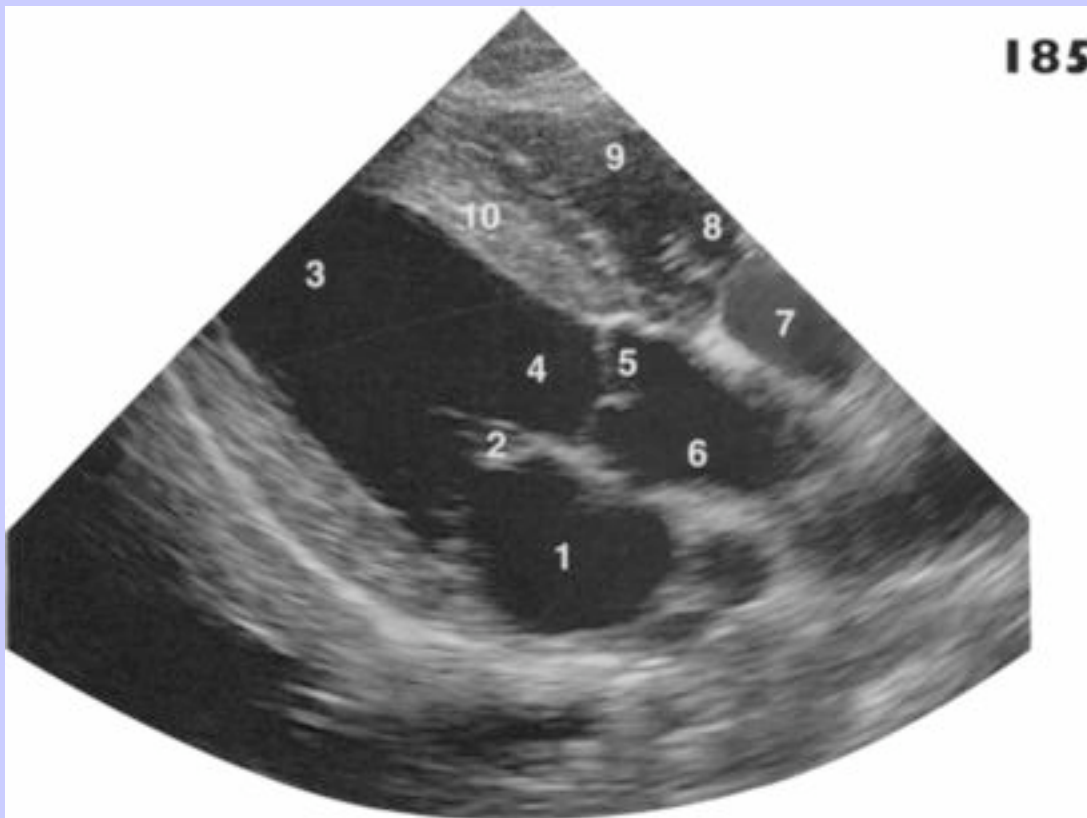
184 Ultrasound scan of the left ventricle of the heart of a dog, taken from the left thoracic wall. The plane of the scan is in the long axis.

119



- | | |
|---|--------------------------------------|
| 1 Left atrium | 4 Chordae tendineae |
| 2 Septal cusp | 5 Papillary muscle in left ventricle |
| 3 Parietal (free wall) cusp | 6 Free wall of left ventricle |
| of mitral (left atrioventricular) valve | 7 Interventricular septum |

185 Ultrasound scan of the heart of a dog, taken from the right side of the thorax. The two atrioventricular valves and the aortic valve are displayed. The plane of the scan is in the long axis.



- 1 Left atrium
- 2 Mitral (left atrioventricular) valve
- 3 Left ventricle
- 4 Outflow tract of 3
- 5 Aortic valve

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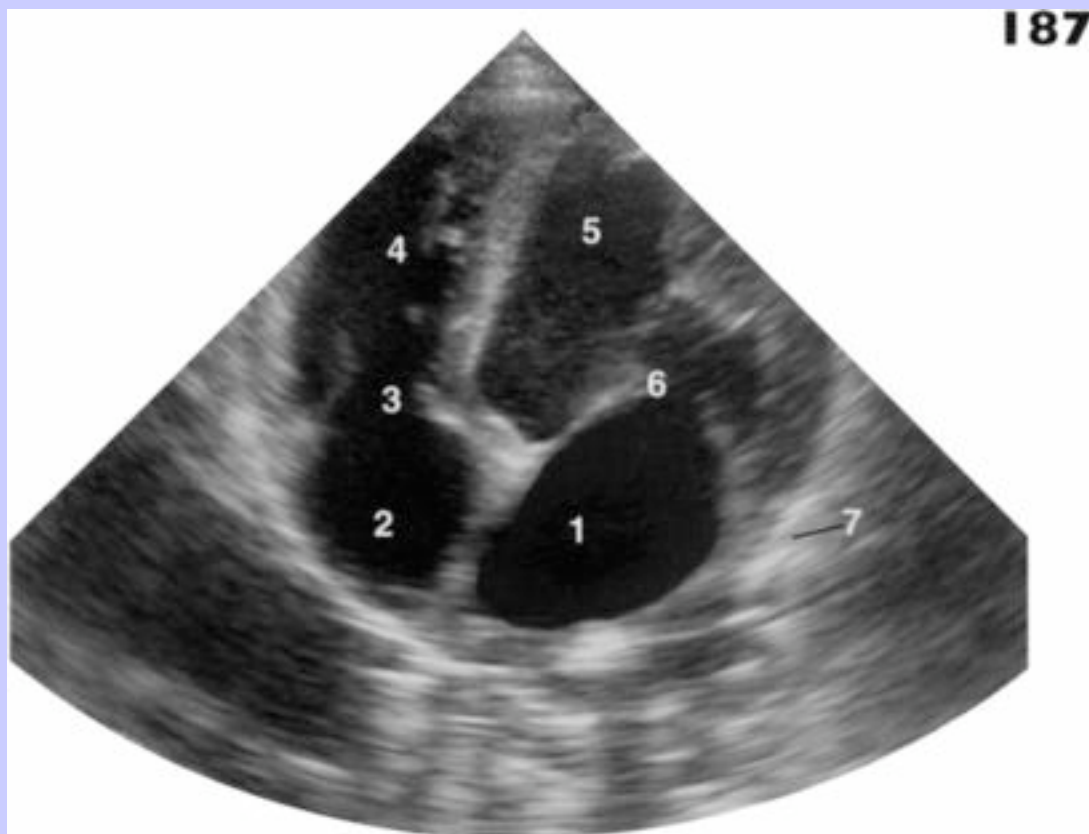
- 6 Aorta
- 7 Right atrium
- 8 Tricuspid (right atrioventricular) valve
- 9 Right ventricle
- 10 Interventricular septum

186 Right parasternal short-axis (fish mouth) view at level of mitral valve.



- | | | | | |
|---|---------------------------|---|---|-------------------------|
| 1 | Parietal (free wall) cusp | } of mitral (left) atrioventricular valve | 3 | Interventricular septum |
| 2 | Septal cusp | | 4 | Right ventricle |

187 Suprasternal four-chamber view of heart



- 1 Left atrium
- 2 Right atrium
- 3 Tricuspid (left atrioventricular) valve
- 4 Right ventricle
- 5 Left ventricle
- 6 Mitral (left atrioventricular) valve
- 7 Pericardium

119

188 Longitudinal section through the heart of a dog, showing the right side and the outflow tract of the left ventricle.

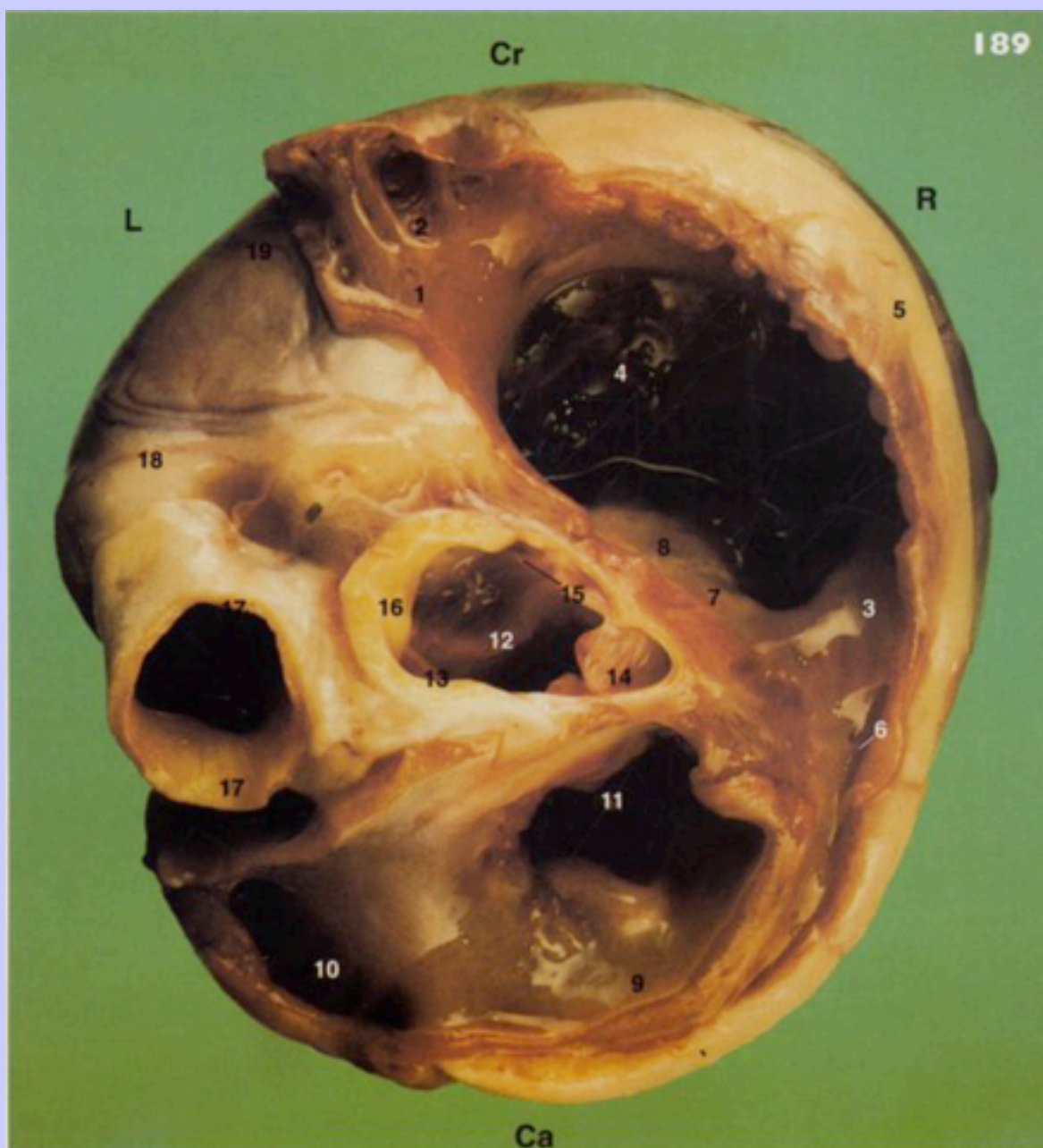
120




- | | | |
|--|---------------------------|---------------------|
| 1 Free wall of right ventricle | 13 Lumen | } of left ventricle |
| 2 Coronary groove | 14 Free wall | |
| 3 Right auricle | 15 Outflow tract | |
| 4 Right atrium | 16 Aortic valve | |
| 5 Tricuspid (right atrioventricular) valve | 17 Aorta | |
| 6 Parietal (free wall) cusp | 18 Brachiocephalic trunk | |
| 7 Septal cusp | 19 Left subclavian artery | |
| 8 Chordae tendineae | 20 Pericardium (cut) | |
| 9 Papillary muscle | 21 Coronary vessels | |
| 10 Lumen of right ventricle | 22 Left auricle | |
| 11 Trabecula septomarginalis | 23 Pulmonary trunk | |
| 12 Interventricular septum | 24 Base | } of heart |
| | 25 Apex | |

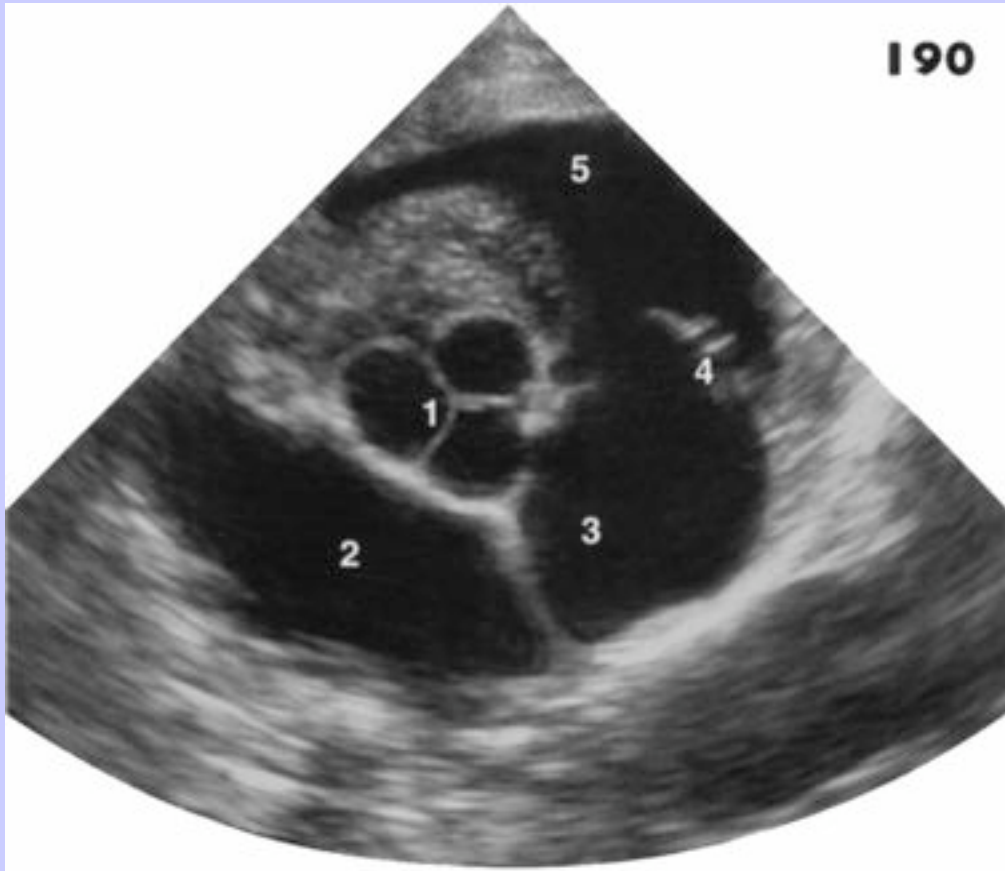
120

189 Dorsal aspect of the base of the heart of a dog, sectioned to reveal the valvular structures. The atria and auricles have been exposed, and the venae cavae and pulmonary veins removed. Cranial (Cr) and caudal (Ca) orientation are indicated.



- 
- 1 Right auricle
 - 2 Mm. pectinati
 - 3 Right atrium
 - 4 Tricuspid (right atrioventricular) valve
 - 5 Coronary groove
 - 6 Opening of coronary sinus
 - 7 Fossa ovalis
 - 8 Interventricular tubercle
 - 9 Left atrium
 - 10 Left auricle
 - 11 Mitral (left atrioventricular) valve
 - 12 Right semilunar valvula
 - 13 Left semilunar valvula
 - 14 Dorsal semilunar valvula
 - 15 Opening for right coronary artery from
right sinus of aorta
 - 16 Aorta
 - 17 Pulmonary trunk
 - 18 Conus arteriosus
 - 19 Wall of right ventricle
- 12, 13, 14 } of aortic valve

190 Ultrasound scan of the right side of the heart of a dog, taken at the left thoracic wall. The apex of the heart is at the top of the scan.



- 1 Aortic valve
- 2 Left atrium
- 3 Right atrium
- 4 Tricuspid (right atrioventricular) valve
- 5 Right ventricle

121

191 Oblique cross section through the heart of a dog, made at the level of the pulmonary valve to show the relationship with the aorta.



- 1 Free wall of right ventricle
- 2 Trabeculae carneae
- 3 Outflow tract of right ventricle
- 4 Pulmonary valve
- 5 Pulmonary artery
- 6 Bifurcation of 5
- 7 Aorta

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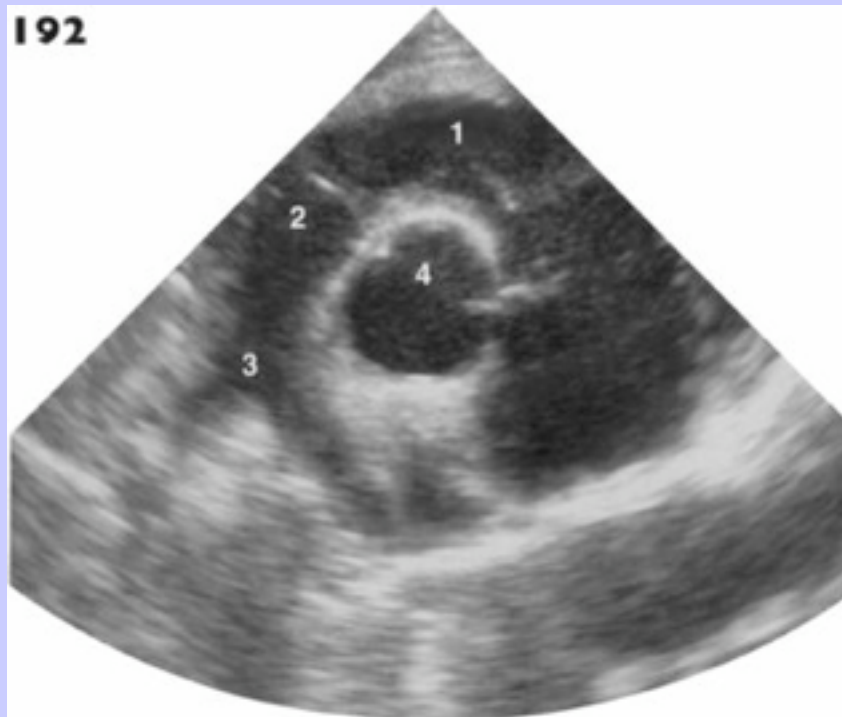
- 8 Right atrium
- 9 Tricuspid (right atrioventricular) valve
- 10 Parietal (free wall) cusp
- 11 Chordae tendineae
- 12 Right ventricle
- 13 Pulmonary vein
- 14 Right auricle

5.0.8

Clinical Note

4 & 5 Note that the pulmonary trunk curls around the aorta so that the two structures are at right angle to each other. This is the scanning field used to interrogate the pulmonary valve in echocardiography. If the aorta is imaged in short axis (cross section) then the pulmonary valve will appear in long axis (longitudinally).

192 Ultrasound scan of the pulmonary valve of the heart of a dog, taken from the left thoracic wall. The pulmonary trunk can be seen curling around the aorta.



- 1 Outflow tract of right ventricle
- 2 Pulmonary valve
- 3 Pulmonary artery
- 4 Aortic valve

6 ABDOMEN AND PELVIC REGION

The bony framework of the abdominal and pelvic regions is first demonstrated before the layers of soft tissue structures have been exposed. The internal viscera of these regions are then comprehensively displayed using dissected and cross-sectional specimens, radiography and B-mode ultrasonography. Variations between the male and female organs including the external genitalia, are exhibited. Particular attention is paid to the topographical features of the abdomen and the pelvic cavities.

193 Cranial aspect of the first lumbar vertebra of a dog.

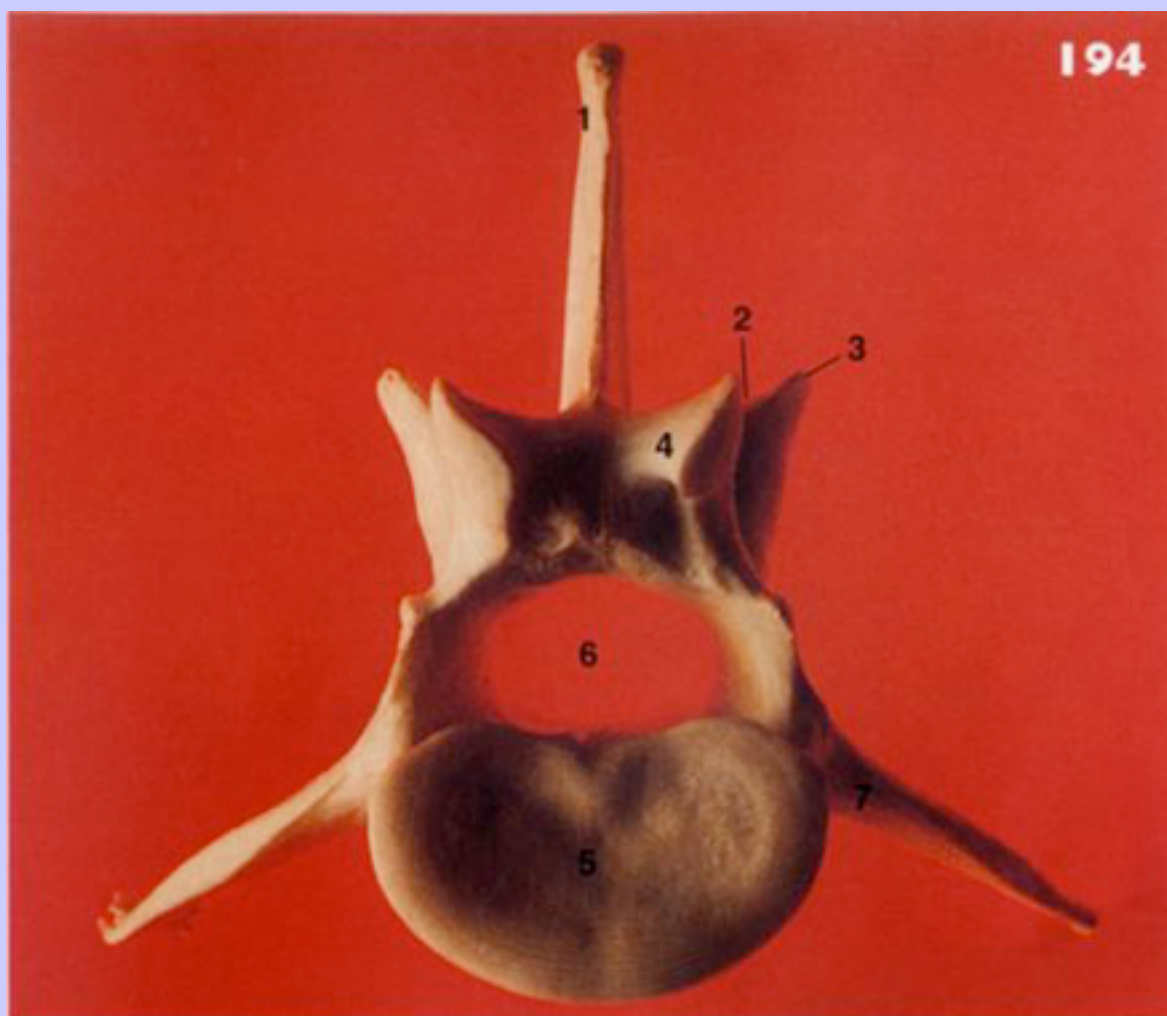


- 1 Spinous process
- 2 Mamillary process
- 3 Cranial articular surface

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- 4 Cranial articular process
- 5 Caudal articular process
- 6 Vertebral foramen
- 7 Body
- 8 Transverse process
- 9 Dorsal foramina

194 Caudal aspect of the fifth lumbar vertebra of a dog.



- 1 Spinous process

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- 2 Cranial articular process
- 3 Mamillary process
- 4 Caudal articular process
- 5 Body
- 6 Vertebral foramen
- 7 Transverse process

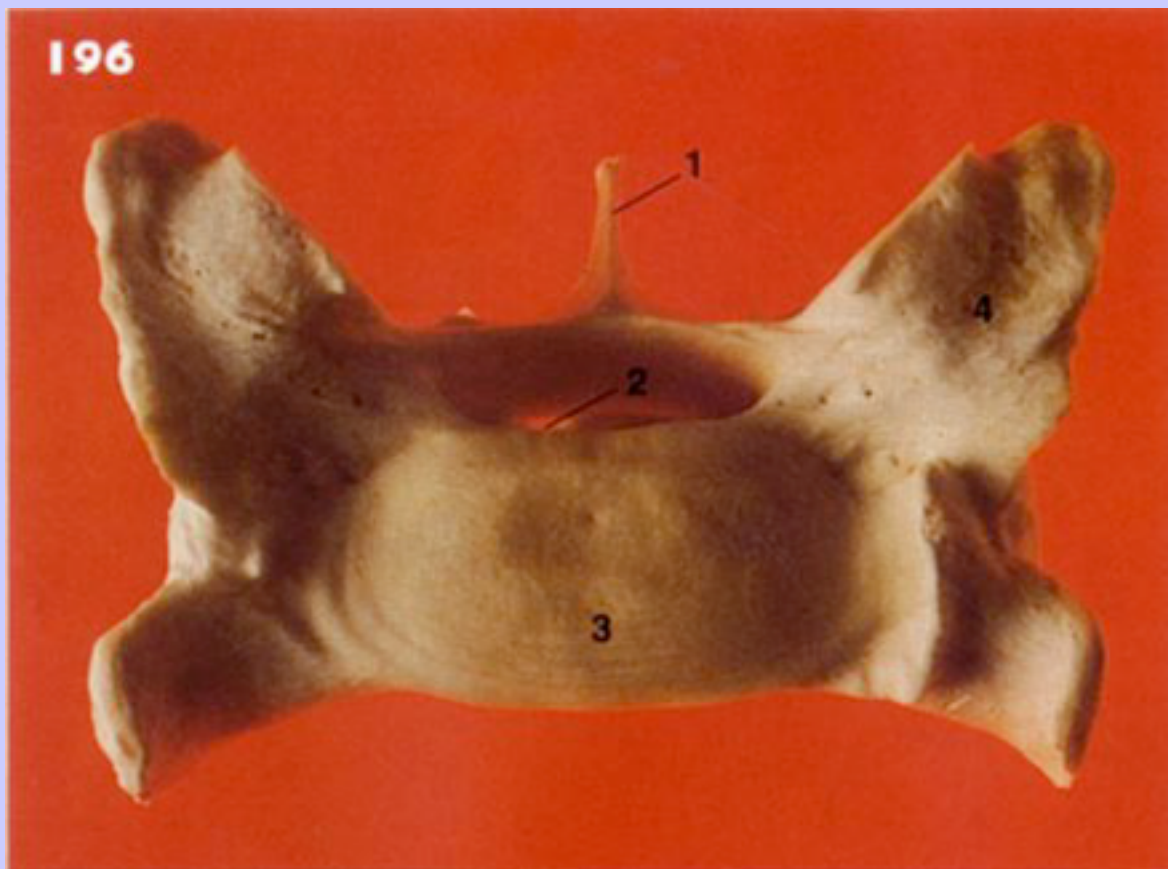
195 Lateral aspect of the sacrum of a dog.



- 1 Median sacral crest
- 2 Intermediate sacral crest
- 3 Wing
- 4 Auricular surface
- 5 Caudal articular process
- 6 Body

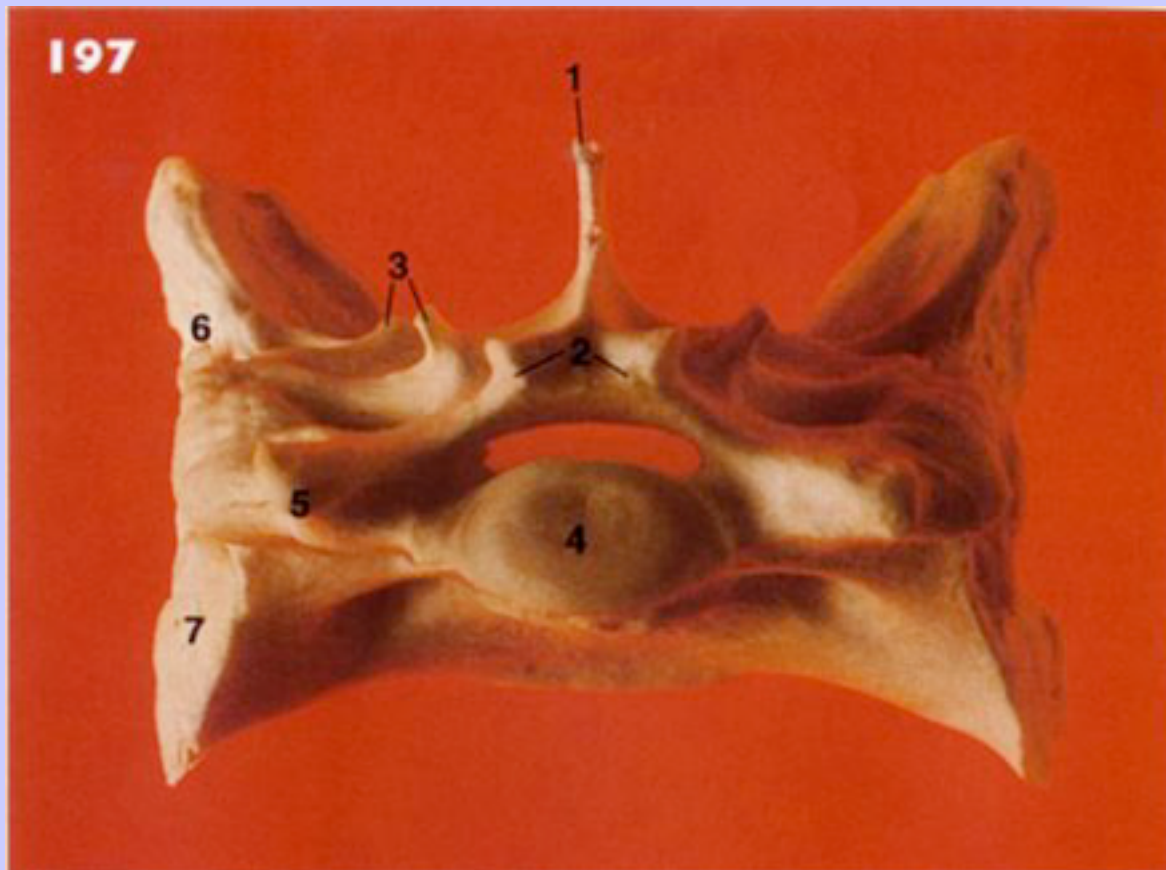
196 Cranial aspect of the sacrum of a dog.

124



- 1 Spinous process of median sacral crest
- 2 Sacral canal
- 3 Base
- 4 Wing

197 Caudal aspect of the sacrum of a dog.



- 1 Spinous process of median sacral crest
- 2 Caudal articular process
- 3 Intermediate sacral crest
- 4 Body
- 5 Lateral sacral crest
- 6 Wing
- 7 Auricular surface

198 Dorsal aspect of the sacrum of a dog.



- 1 Base
- 2 Sacral canal
- 3 Cranial articular surface
- 4 Intermediate sacral crest
- 5 Lateral sacral crest
- 6 Caudal articular process

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- 7 Median sacral crest
- 8 Apex
- 9 Dorsal sacral foramina

199 Ventral aspect of the sacrum of a dog.



- 1 Base
- 2 Promontory
- 3 Wing

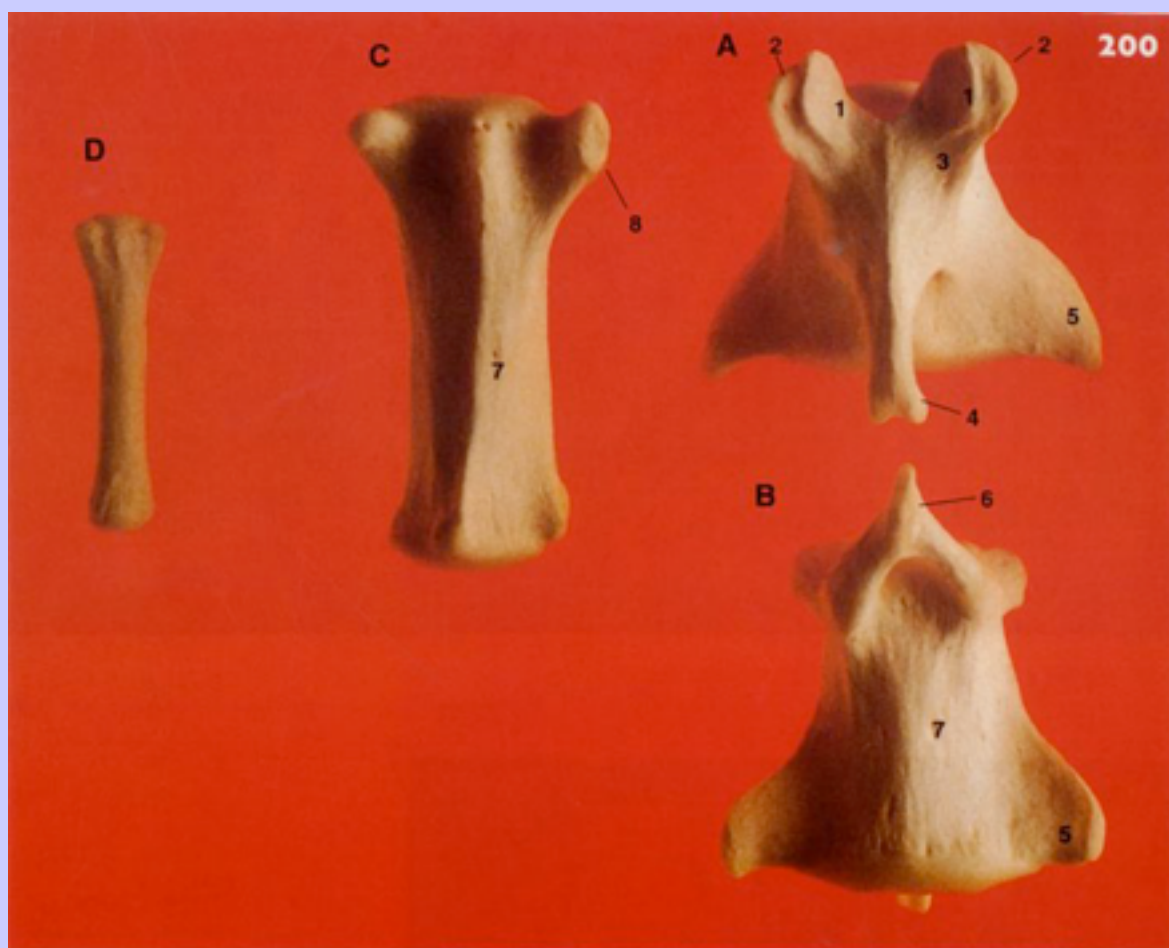
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- 4 Transverse lines
- 5 Pelvic sacral foramina
- 6 Caudal articular process
- 7 Apex

124

125

200 Dorsal aspect of the fifth caudal vertebra (A), ventral aspect of the fourth (B) and sixth (C) caudal vertebra, and dorsal aspect of the fourteenth caudal vertebra (D) of a dog.

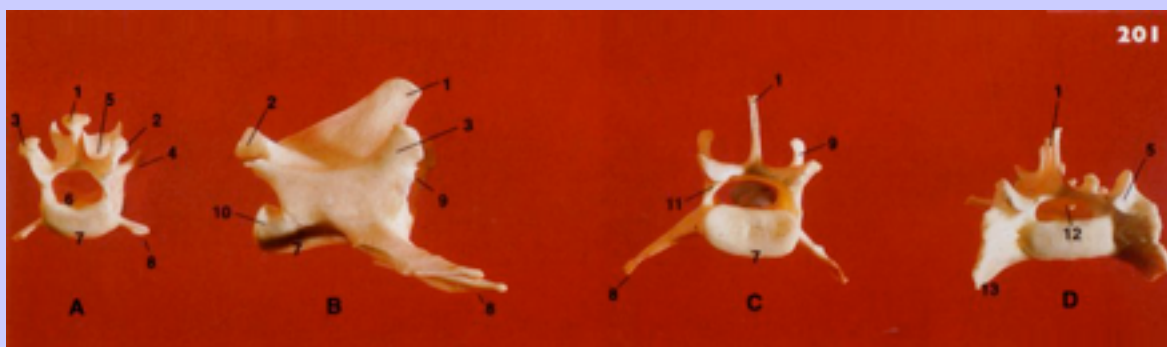


- 1 Cranial articular process
- 2 Mamillary process
- 3 Neural arch

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- 4 Caudal articular process
- 5 Transverse process
- 6 Haemal arch
- 7 Body
- 8 Cranial transverse process

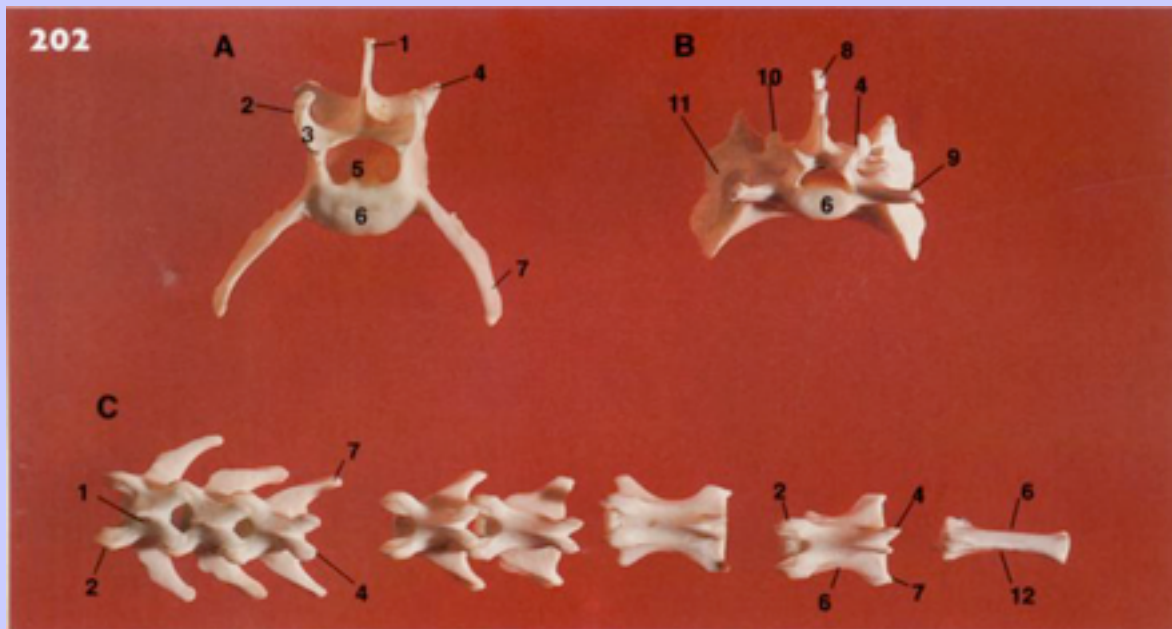
201 Cranial aspect of the first lumbar vertebra (A), lateral (right side) aspect of the fifth lumbar vertebra (B), caudal aspect of the seventh lumbar vertebra (C), and cranial aspect of the sacrum of a cat.



- 1 Spinous process
- 2 Caudal articular process
- 3 Mamillary process
- 4 Accessory process
- 5 Cranial articular surface
- 6 Vertebral foramen
- 7 Body
- 8 Transverse process
- 9 Cranial articular process
- 10 Caudal vertebral notch
- 11 Caudal articular surface
- 12 Sacral canal

202 Cranial aspect of the seventh lumbar vertebra (A), caudal aspect of the sacrum (B), and dorsal aspect of the first, second, and third caudal vertebrae (C) of a cat.

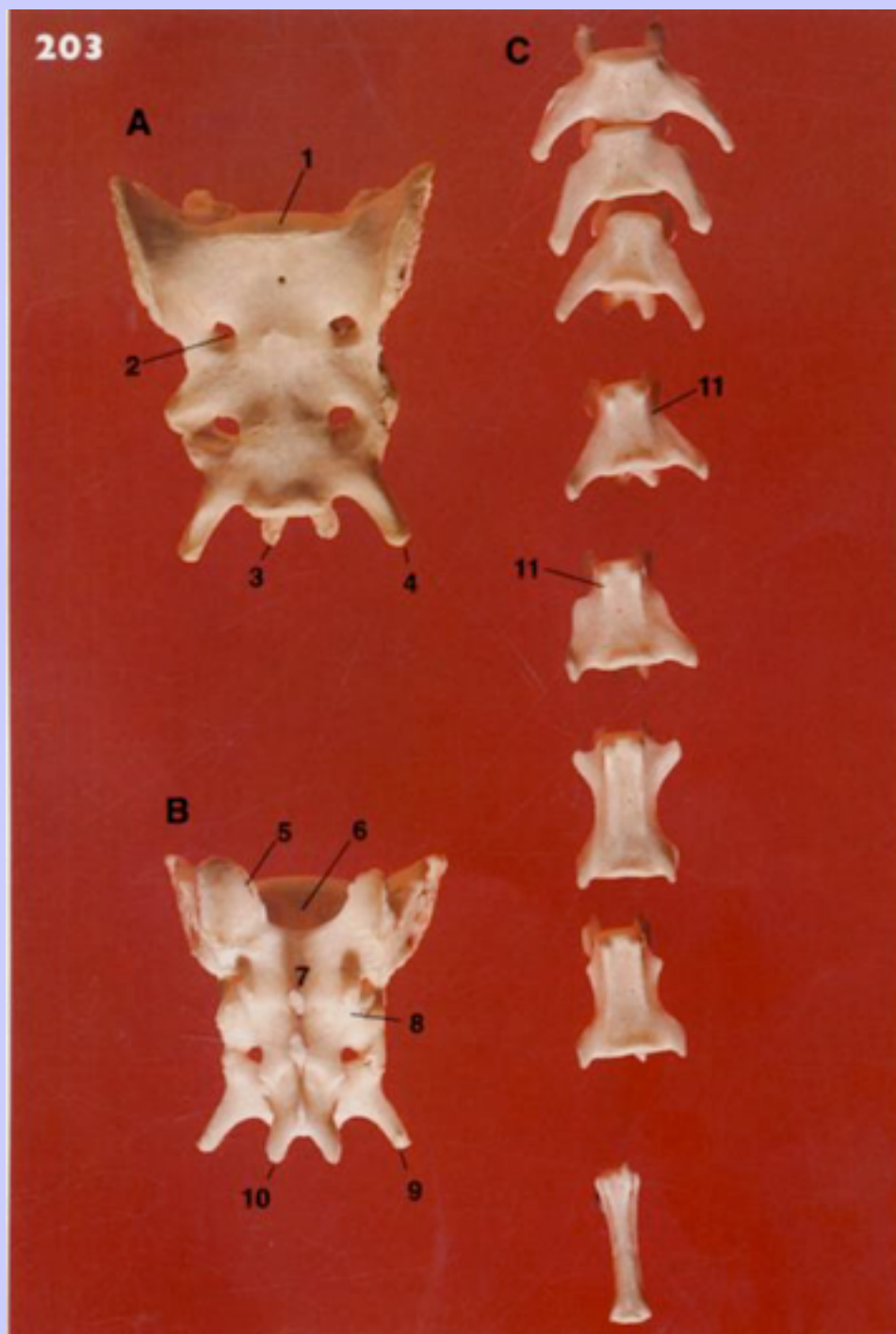
126



- 1 Spinous process
- 2 Cranial articular process
- 3 Cranial articular surface
- 4 Caudal articular process
- 5 Vertebral foramen
- 6 Body
- 7 Transverse process
- 8 Spinous processes (median sacral crest)
- 9 Lateral crest
- 10 Intermediate sacral crest
- 11 Wing

12 Distal segment of caudal vertebra (dorsal)

203 Ventral (A) and dorsal aspect (B) of the sacrum, and ventral aspect (C) of several caudal vertebrae of a cat.



- 1 Promontory
- 2 Pelvic sacral foramina
- 3 Caudal articular surface
- 4 Transverse process of lateral sacral crest
- 5 Cranial articular surface
- 6 Sacral canal
- 7 Median sacral crest
- 8 Intermediate sacral crest
- 9 Lateral sacral crest
- 10 Caudal articular process
- 11 Haemal process

126

204 Lateral aspect of the articulated lumbar vertebrae of a dog.

127

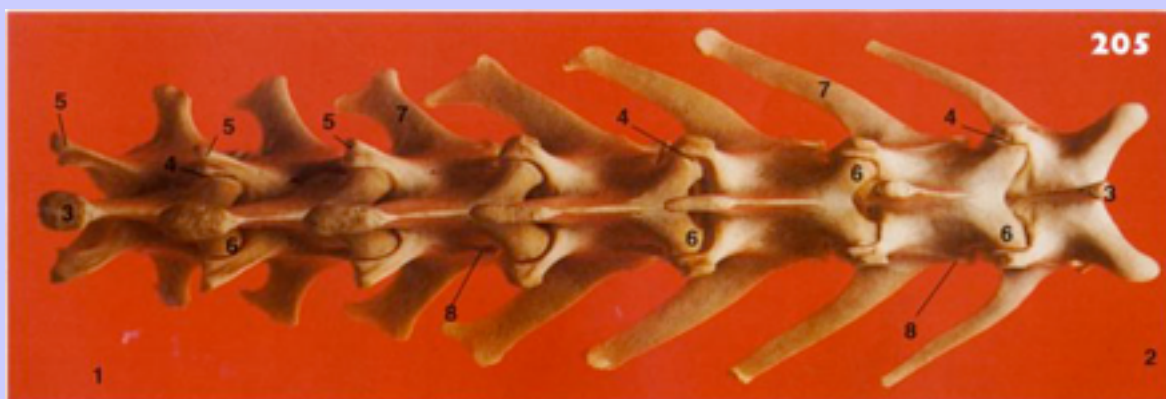


- 1 First lumbar vertebra
- 2 Seventh lumbar vertebra
- 3 Body
- 4 Spinous process
- 5 Cranial articular process

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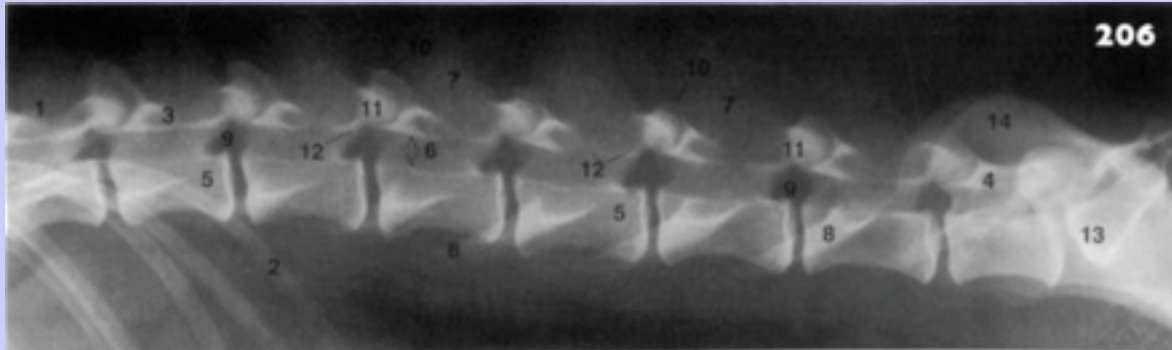
- 6 Mamillary process
- 7 Caudal articular process
- 8 Transverse process
- 9 Accessory process
- 10 Intervertebral foramen

205 Dorsal aspect of the articulated lumbar vertebrae of a dog.



- 1 First lumbar vertebra
- 2 Seventh lumbar vertebra
- 3 Spinous process
- 4 Cranial articular process
- 5 Mamillary process
- 6 Caudal articular process
- 7 Transverse process
- 8 Accessory process

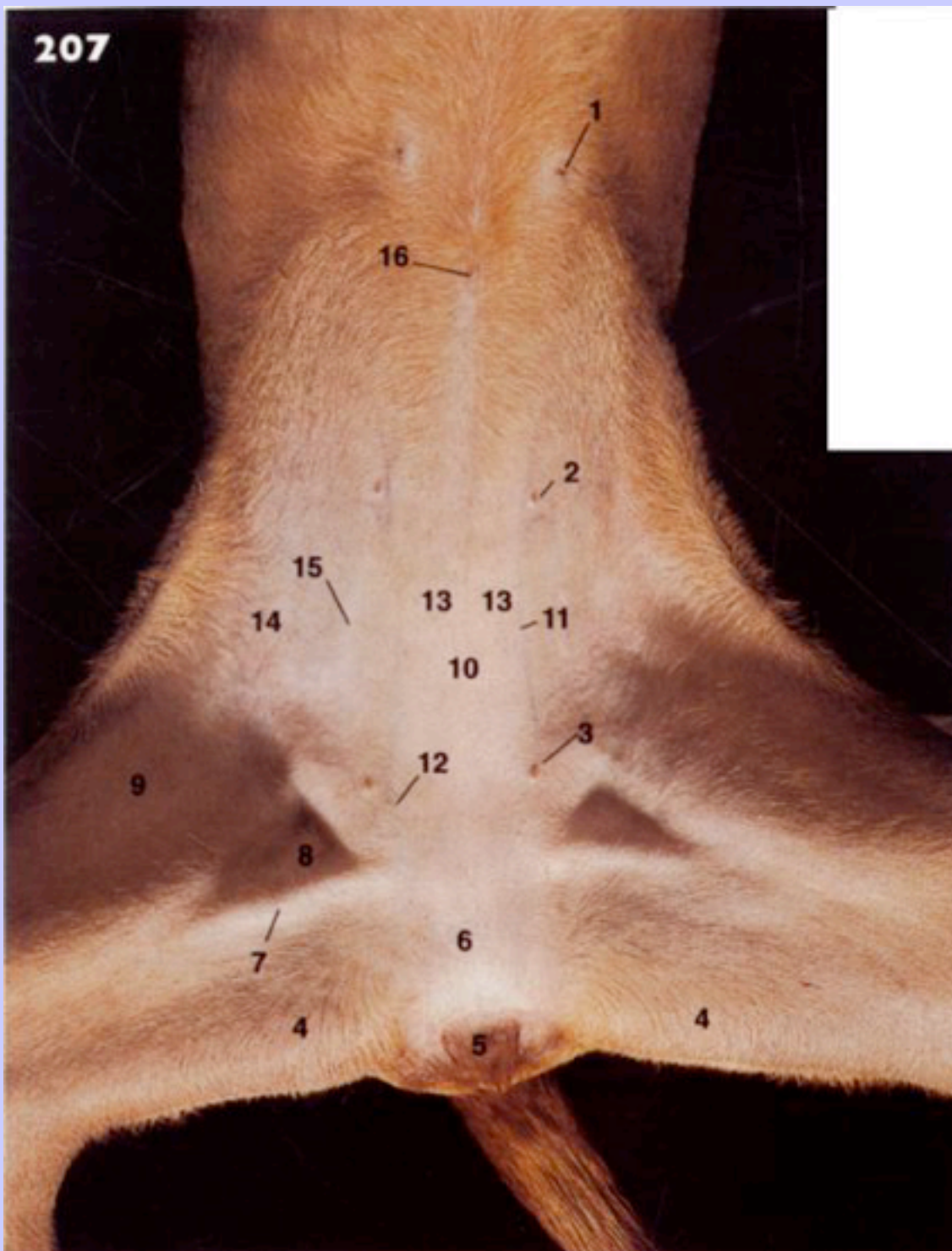
206 Radiograph of the lateral aspect of the lumbar region of the vertebral column of a dog.



- | | |
|---|---|
| 1 Thirteenth thoracic vertebra | 8 Transverse process of lumbar vertebra |
| 2 Thirteenth (floating) rib | |
| 3 First } lumbar vertebra | 9 Intervertebral foramina |
| 4 Seventh } | 10 Cranial articular process |
| 5 Body of vertebra | 11 Caudal articular process |
| 6 Dorsal and ventral borders of vertebral foramen (vertebral canal) | 12 Accessory process |
| 7 Spinous process | 13 Body of sacrum |
| | 14 Wing of ilium |

127

207 Ventral aspect of the intact abdominal wall and inguinal region of a nulliparous bitch.



- | | | |
|------------------------------|-----------------|--|
| 1 Teat of cranial abdominal | } mammary gland | 10 Median raphe over linea alba |
| 2 Teat of caudal abdominal | | 11 Caudal superficial epigastric artery and vein |
| 3 Teat of inguinal abdominal | | 12 Level of superficial ring of inguinal canal |
| 4 M. gracilis | | 13 M. rectus abdominis |
| 5 Vulva | | 14 M. obliquus externus abdominis and M. obliquus internus abdominis |
| 6 Symphysis pelvis | | 15 Lateral border of sheath of M. rectus abdominis |
| 7 M. pectineus | | 16 Umbilical scar |
| 8 Femoral triangle | | |
| 9 M. sartorius | | |



208 Ventral aspect of the intact thoracic, abdominal and inguinal regions of a pregnant bitch.



- | | | |
|---------------------------------------|-----------------|-------------------------------------|
| 1 Cranial thoracic | } mammary gland | 7 Umbilical scar |
| 2 Caudal thoracic | | 8 Teat with orifices |
| 3 Cranial abdominal | | 9 Median raphe overlying linea alba |
| 4 Caudal abdominal | | 10 Vulva |
| 5 Inguinal | | |
| 6 Level of xiphoid process of sternum | | |



6.0.1

Clinical Note

1-3 & 1-5 It is of importance to know the direction of flow of the lymphatic drainage from the mammary glands when examining these glands for spread of infection or tumour formation. The cranial and caudal abdominal glands drain to the sternal or axillary lymphocentres. The caudal abdominal and inguinal glands drain to the inguinal lymphocentres, therefore drainage from the cranial abdominal gland may travel both cranially and caudally.

128

209 Ventral aspect of the thoracic and abdominal regions of a dog. The skin has been removed and the deep pectoral muscle reflected to reveal the muscles of the abdominal wall.





- | | |
|----------------------------------|--|
| 1 M. pectoralis profundus | 9 Contribution of 6 running in superficial sheath of M. rectus abdominis |
| 2 M. scalenus | |
| 3 M. rectus abdominis | |
| 4 Pars costalis | } of M. obliquus externus abdominis |
| 5 Pars lumbalis | |
| 6 Aponeurosis (cut edge) | |
| 7 Sheath of M. rectus abdominis | 10 External inguinal ring |
| 8 M. obliquus internus abdominis | 11 Vaginal process with external pudendal vessels |
| | 12 Femoral triangle |
| | 13 M. pectineus |
| | 14 Prepubic tendon |
| | 15 M. sartorius |
| | 16 Superficial inguinal lymph node |
| | 17 Reflected skin |

210 Ventral aspect of the thoracic and abdominal regions of a dog. The deep pectoral and external oblique abdominal muscles have been removed on the right side to reveal the internal oblique abdominal muscles.



- | | | | | |
|---|---|-------------------------------------|----|--|
| 1 | M. pectoralis profundus | | 8 | Aponeurosis of M. obliquus internus abdominis in superficial sheath of M. rectus abdominis |
| 2 | M. rectus abdominis | | | |
| 3 | M. obliquus externus abdominis | | | |
| 4 | Pars costalis | } of M. obliquus internus abdominis | 9 | Aponeurosis of M. obliquus internus abdominis running deep to M. rectus abdominis |
| 5 | Pars abdominis | | | |
| 6 | Pars inguinalis (from inguinal ligament) | | 10 | Linea alba |
| 7 | M. transversus abdominis seen through aponeurosis of M. obliquus internus abdominis | | 11 | Thirteenth (floating) rib |
| | | | 12 | Reflected skin |
| | | | 13 | M. obliquus externus abdominis (cut edge) |

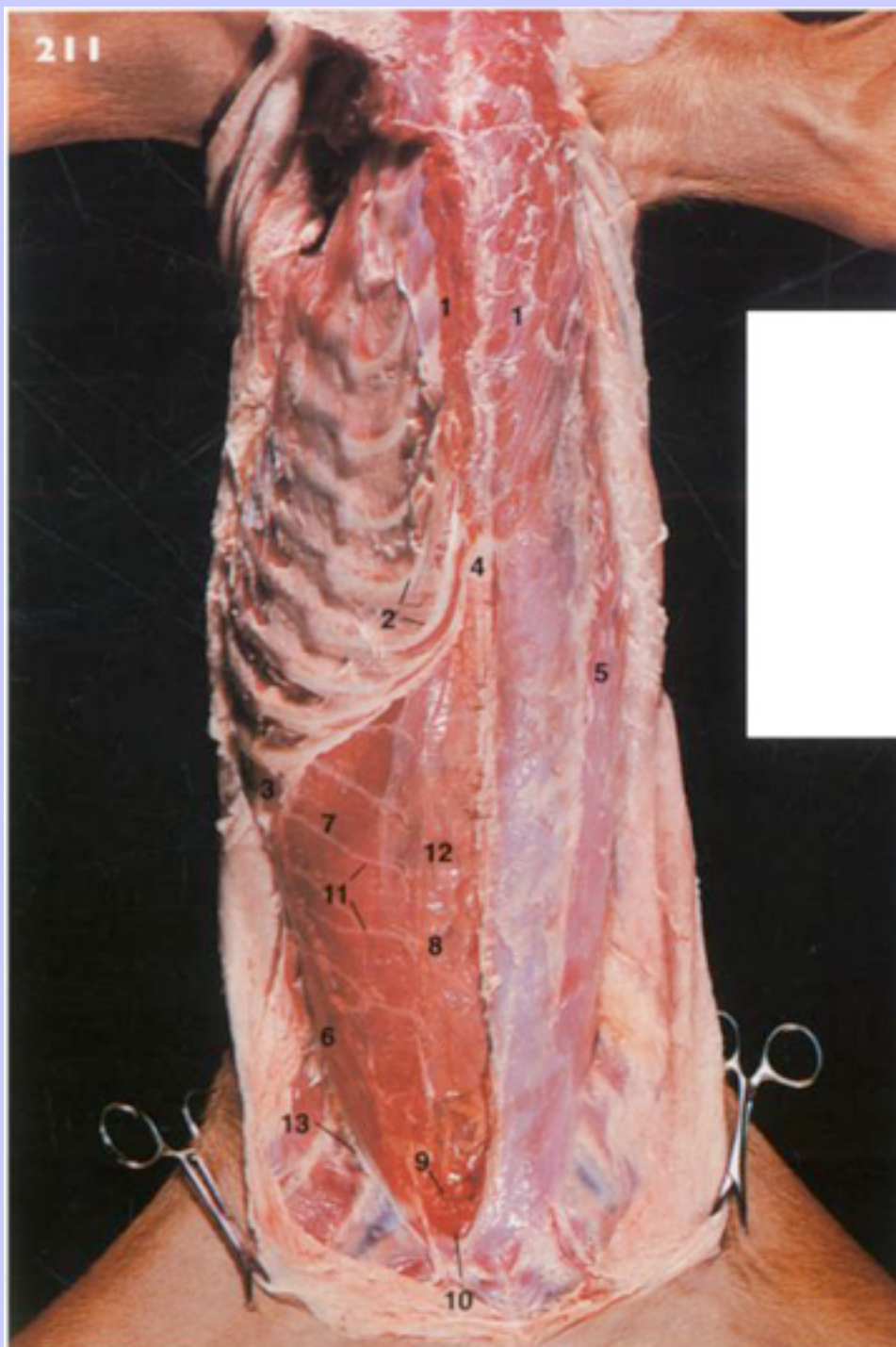


6.0.2 Clinical Note

10 To gain surgical access to the abdominal cavity, incisions are made precisely in the midline ventrally, through the linea alba. Using the linea alba as a portal for entry minimises haemorrhage and provides a sound tissue base for insertion of sutures.

129

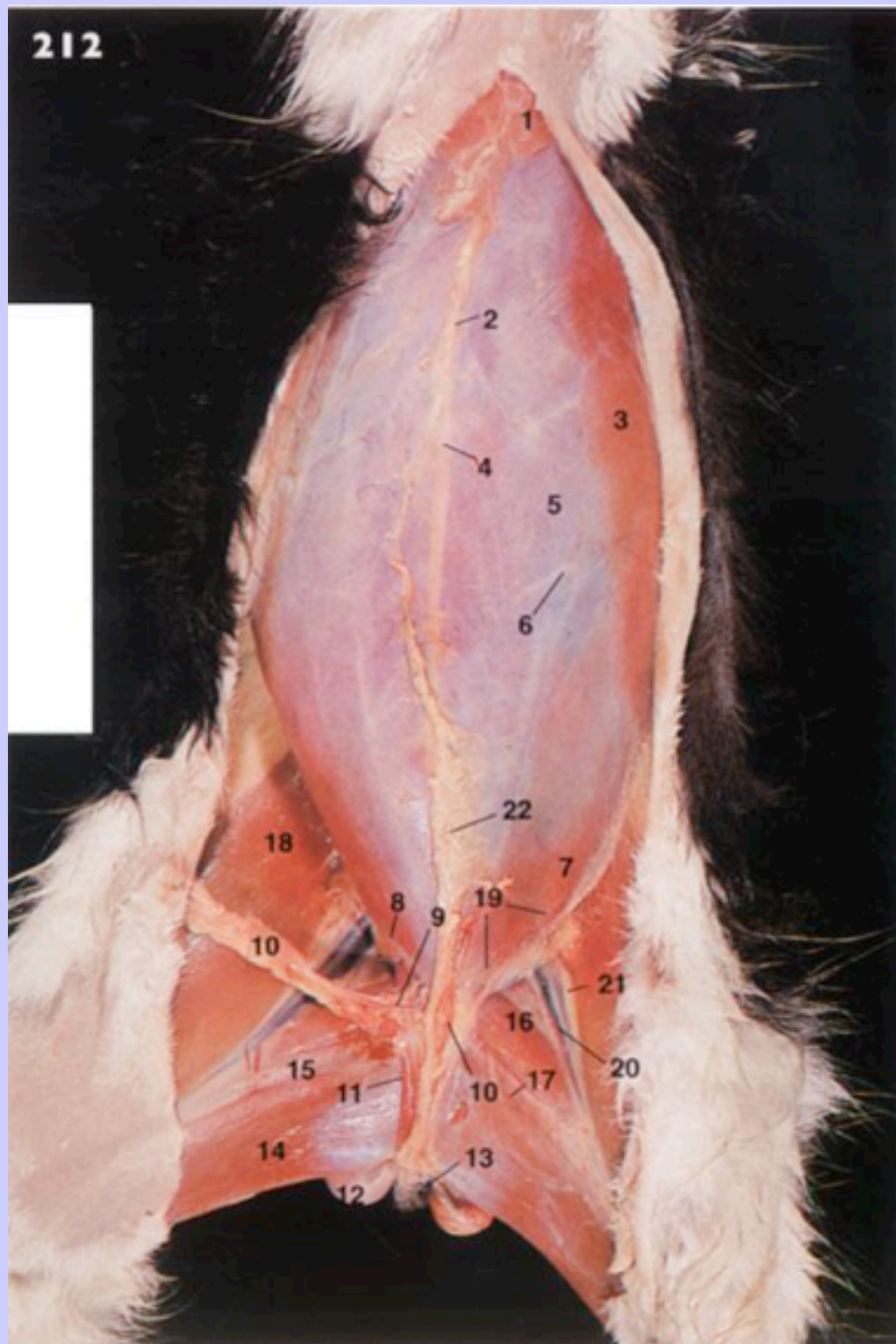
211 Ventral aspect of the thoracic and abdominal regions of a dog. The deep pectoral, external and internal oblique abdominal, and rectus muscles have been removed on the right side to reveal the deeper layers.





- | | |
|---|--|
| 1 M. pectoralis profundus | 10 M. rectus abdominis (cut edge) |
| 2 Costal cartilages | 11 Medial branches of ventral divisions of thoracic and lumbar nerves |
| 3 Thirteenth rib (floating) | 12 Abdominal viscera seen through aponeurosis of 6 and 7, fascia transversalis and parietal peritoneum |
| 4 Xiphoid process of sternum | 13 M. obliquus internus abdominis (cut edge) |
| 5 M. obliquus externus abdominis | |
| 6 Pars lumbalis | |
| 7 Pars costalis | |
| 8 Aponeurosis lying deep to 10 (resected) | |
| 9 Aponeurosis lying superficial to 10 | |
- } of M. transversus abdominis

212 Ventral aspect of the superficial abdominal muscles of a male cat.



- | | |
|---|--|
| 1 M. pectoralis profundus | 10 Chain of superficial inguinal lymph nodes |
| 2 Linea alba | 11 Spermatic cord |
| 3 M. obliquus externus abdominis | 12 Testis |
| 4 Umbilical scar | 13 Prepuce |
| 5 Superficial sheath | 14 M. gracilis |
| 6 Tendinous inscriptions | 15 M. adductor |
| 7 M. obliquus internus abdominis seen through aponeurotic sheet of M. obliquus externus abdominis | 16 M. pectineus |
| 8 External inguinal ring | 17 Branch of obturator nerve |
| 9 External pudendal artery and vein | 18 M. sartorius |
| | 19 Femoral triangle |
| | 20 Femoral artery and vein |
| | 21 Saphenous nerve (branch of femoral nerve) |
| | 22 Subcutaneous fat |



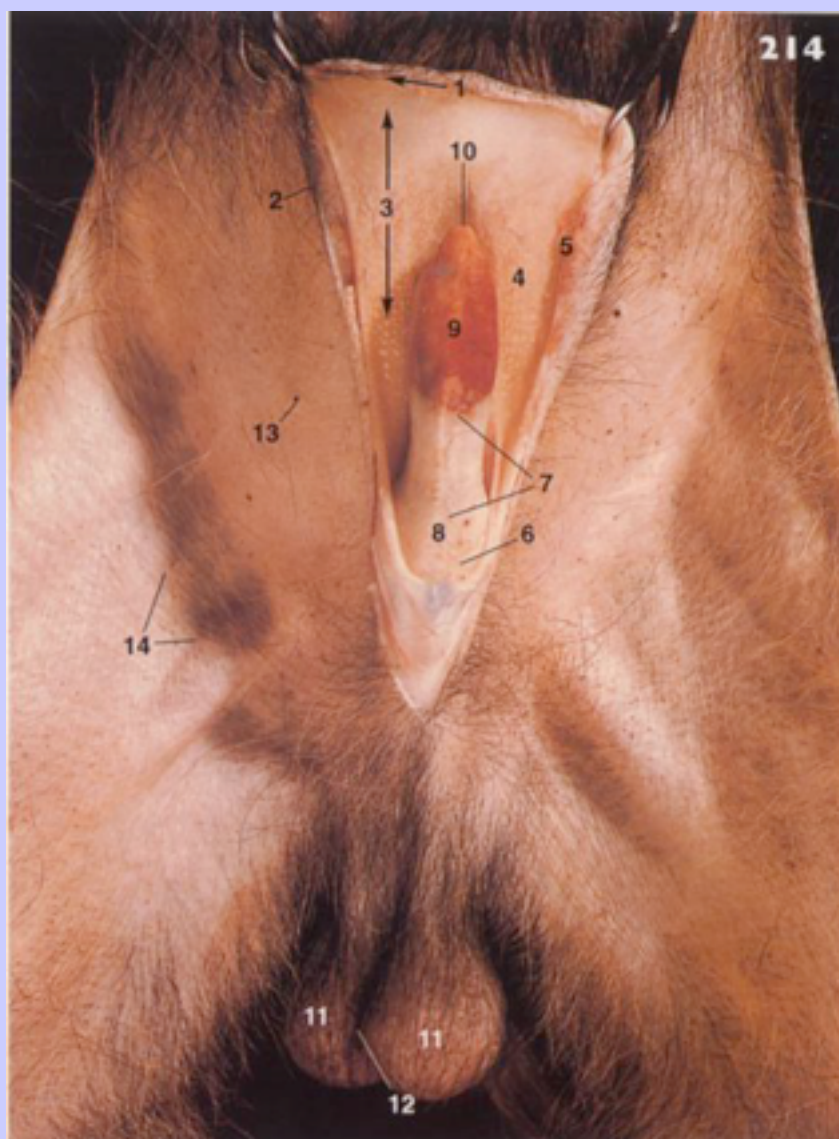
213 Ventral aspect of the prepuce of a male dog.

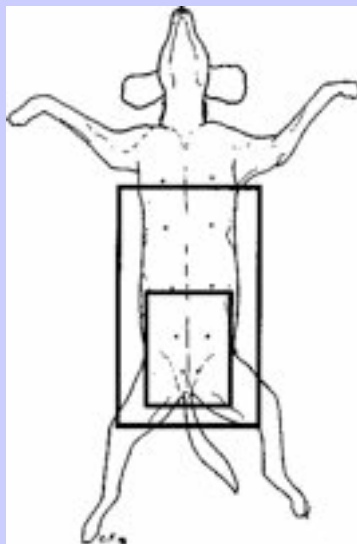
131



- 1 Preputial orifice
- 2 Median fold
- 3 Glans penis within prepuce
- 4 Caudal extremity of os penis
- 5 Scrotum

214 Ventral aspect of the inguinal region of a male dog. The prepuce has been opened ventrally to expose the preputial cavity and the glans penis.

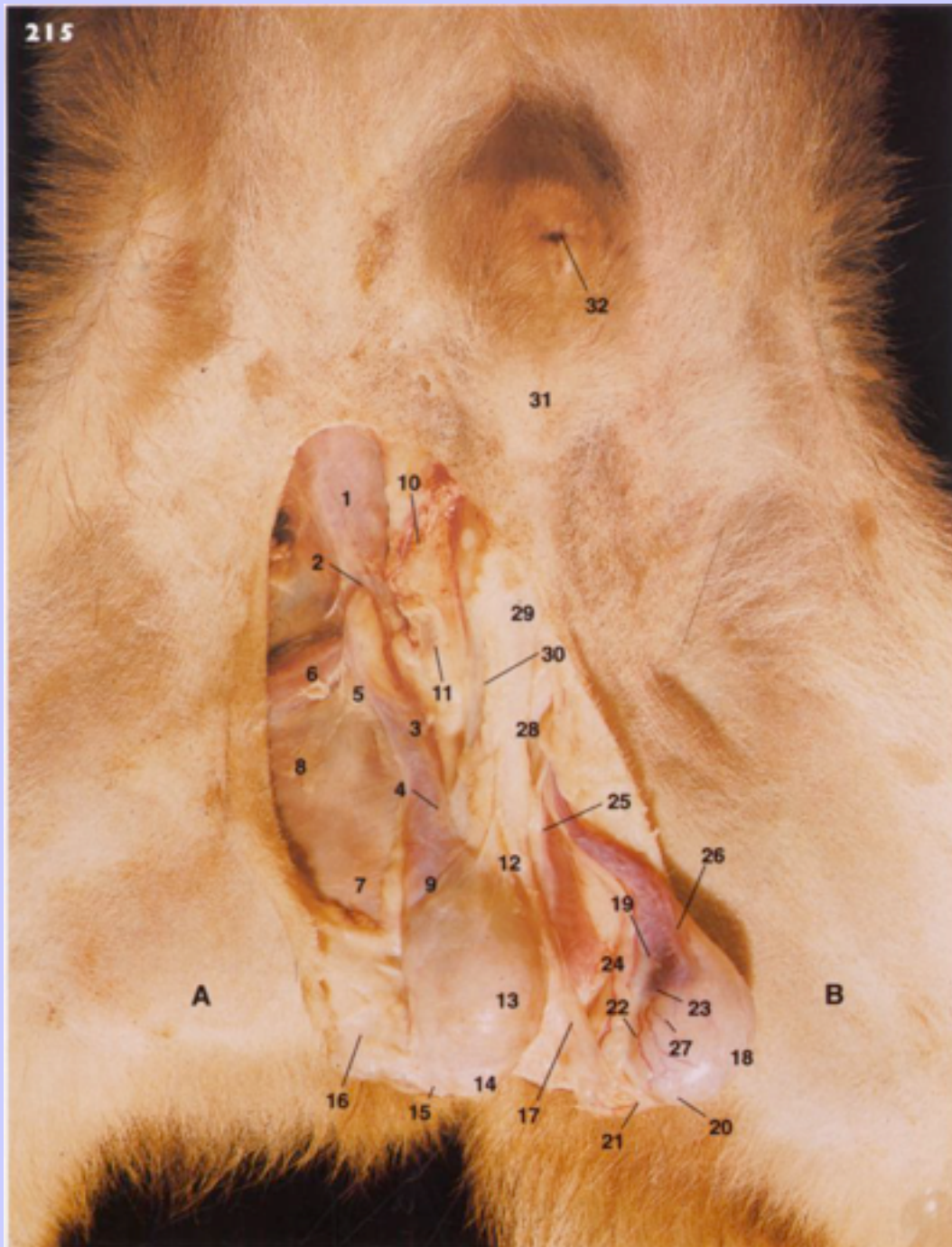





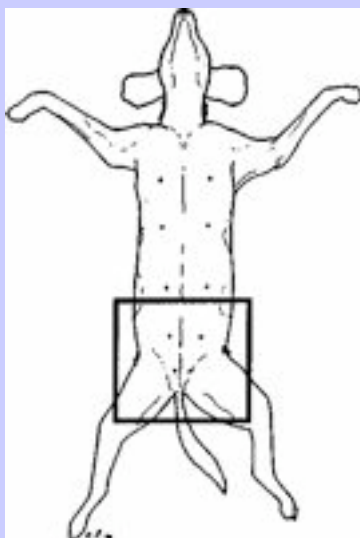
- | | |
|--|---|
| 1 Preputial orifice (opened ventrally) | 8 Bulbus glandis |
| 2 Outer surface } of prepuce | 9 Pars longa glandis |
| 3 External lamina } | 10 External urethral orifice |
| 4 Lymph nodules | 11 Scrotal sacs |
| 5 M. preputialis | 12 Median raphe |
| 6 Fomix | 13 Teat of undeveloped inguinal mammary gland |
| 7 Internal lamina of prepuce | 14 Femoral triangle |

131

215 Ventral aspect of the inguinal region of a male dog. The scrotal wall has been sectioned on the right side (A) to reveal the testis within the parietal layer of the vaginal tunic. On the left side (B) the parietal layer has been resected to expose the visceral layer of the vaginal tunic covering the testis.



- 
- 1 M. obliquus externus abdominis
2 Superficial inguinal ring
3 Spermatic cord
4 Vaginal process
5 External abdominal fascia
6 M. pectineus
7 M. gracilis
8 M. adductor
9 M. cremaster within spermatic cord
10 External pudendal artery and vein
11 Superficial inguinal lymph node
12 Spermatic fascia
13 Testis within parietal layer of vaginal tunic
14 Tail of epididymis
15 Scrotal ligament
16 Scrotal wall
17 Median scrotal septum
18 Testis covered in visceral layer of vaginal tunic
19 Ductus deferens
20 Proper ligament of testis
21 Ligament of tail of epididymis
22 Artery and vein of ductus deferens
23 Mesoductus deferens
24 M. cremaster
25 Parietal layer of vaginal tunic
26 Pampiniform plexus of veins
27 Testicular veins
28 Body
29 Bulbus glandis
30 Dorsal artery and vein } of penis
31 Prepuce
32 Preputial orifice



6.0.3

Clinical Note

- 13** The exposure of the testis on side (A) represents the field seen in the technique of closed castration, i.e. the parietal layer of the vaginal tunic is still intact and the potential space of the peritoneal cavity has not been breached.
- 18** The exposure of the testis on side (B) represents the field seen in the technique of open castration, i.e. the parietal layer of the vaginal tunic has been incised and thus the potential space of the peritoneal cavity has been breached.

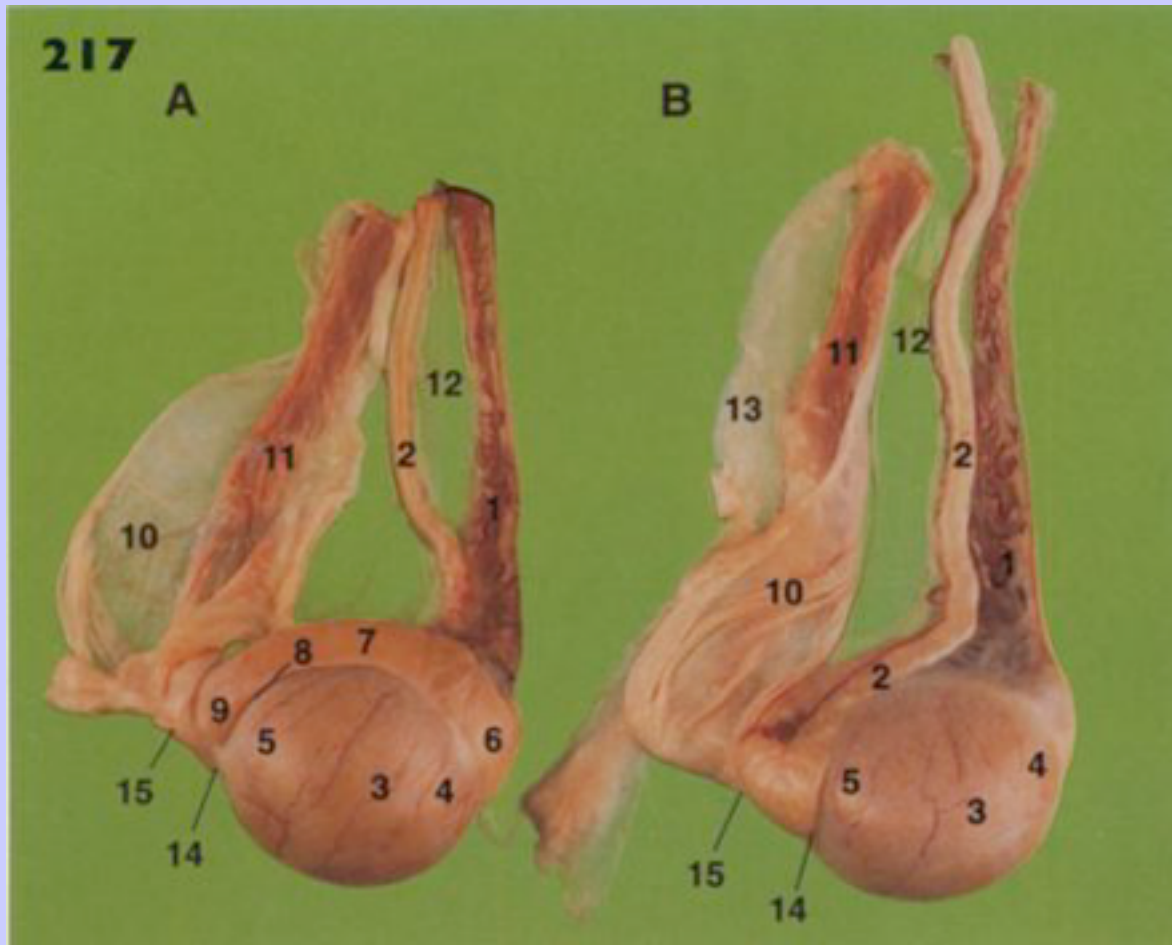
132

216 Caudal aspect of the perineum of male cat.



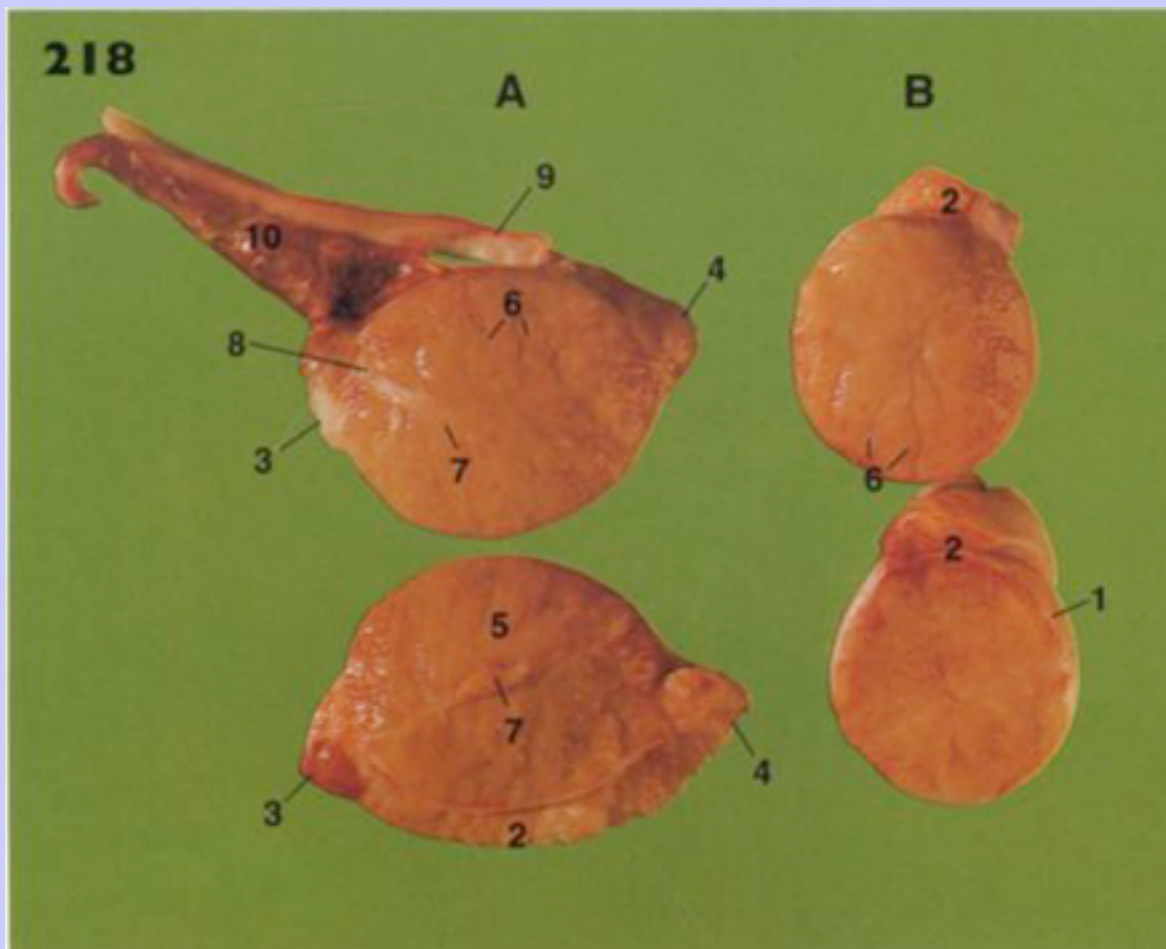
- 1 M. sacrocaudalis ventralis lateralis
- 2 M. rectococcygeus
- 3 M. coccygeus
- 4 M. levator ani
- 5 M. sphincter ani externus
- 6 Anus
- 7 Position of anal sac
- 8 M. retractor penis overlying M. bulbospongiosum
- 9 Body of penis
- 10 M. ischiocavernosus
- 11 Ischiatic tuberosity
- 12 Glans penis
- 13 External urethral orifice
- 14 Prepuce (opened)
- 15 Testis covered by parietal layer of vaginal tunic
- 16 Spermatic cord
- 17 Sacrotuberous ligament (vestigial)
- 18 M. obturator internus
- 19 M. gluteus superficialis
- 20 M. abductor cruris cranialis (M. coccygeofemoralis)
- 21 M. biceps femoris
- 22 M. semitendinosus
- 23 M. semimembranosus

217 Lateral (A) and medial (B) aspect of the testes of a dog, after removal from the scrotal sacs and severance of the spermatic cords.



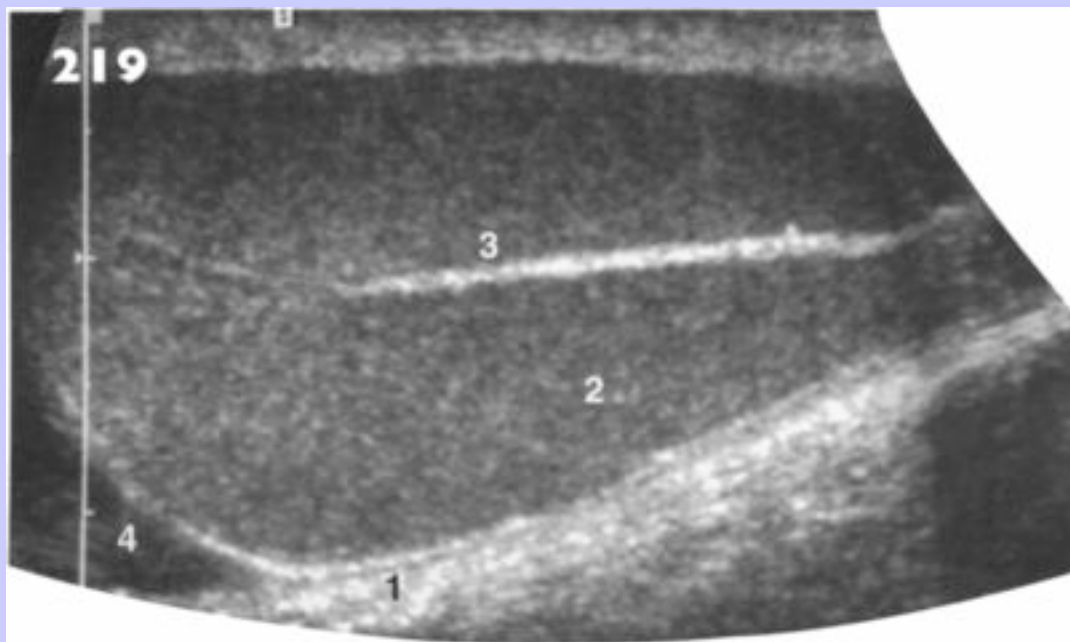
- | | |
|--|------------------------------------|
| 1 Pampiniform plexus of veins | 10 Parietal layer of vaginal tunic |
| 2 Ductus deferens | 11 M. cremaster |
| 3 Testis covered in visceral vaginal tunic | 12 Mesofuniculus |
| 4 Head (extremitas capitata) | 13 External spermatic fascia |
| 5 Tail (extremitas caudata) | 14 Proper ligament of testis |
| 6 Head | 15 Ligament of tail of epididymis |
| 7 Body | |
| 8 Sinus | |
| 9 Tail | |

218 Longitudinal (A) and transverse (B) sections of the testis of a dog.



- | | | | |
|---|---|----|-----------------------------|
| 1 | Tunica albuginea (covered in visceral layer of vaginal tunic) | 6 | Connective tissue septa |
| 2 | Body | 7 | Mediastinum testis |
| 3 | Head | 8 | Rete testis |
| 4 | Tail | 9 | Ductus deferens |
| 5 | Parenchyma testis | 10 | Pampiniform plexus of veins |

219 Longitudinal ultrasound scan of the testis of a dog.



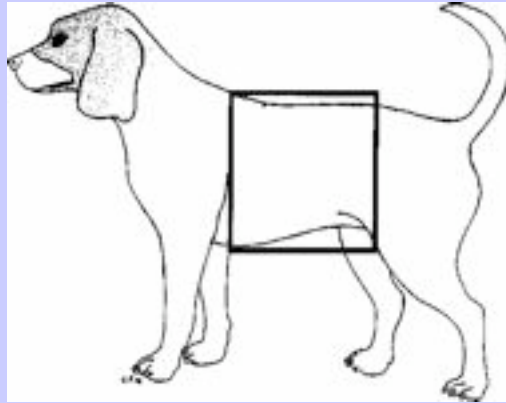
- 1 Tunics albuginea
- 2 Parenchyma testis
- 3 Mediastinum
- 4 Epididymis

134

220 Lateral aspect of the left lateral abdominal region of a dog. The skin has been reflected to reveal the muscles of the region, and the abdominal muscle layers have been serially sectioned.



- | | |
|--|--|
| 1 M. latissimus dorsi | 10 Lateral cutaneous femoral nerve (ventral branch of fourth lumbar nerve) |
| 2 Pars costalis } of M. obliquus externus abdominis | 11 Distal lateral cutaneous branches of intercostal nerves |
| 3 Pars lumbalis } | 12 Aponeurosis of M. obliquus externus abdominis |
| 4 M. obliquus internus abdominis | 13 M. rectus abdominis (deep to 12) |
| 5 M. transversus abdominis | 14 M. sartorius |
| 6 Fascia transversalis | 15 Thoracolumbar fascia |
| 7 Ventral divisions of last thoracic and first lumbar nerves | 16 Thirteenth (floating) rib |
| 8 Caudal iliohypogastric nerve (ventral branch of second lumbar nerve) | 17 Costal arch of costal cartilages |
| 9 Ilioinguinal nerve (ventral branch of third lumbar nerve) | |



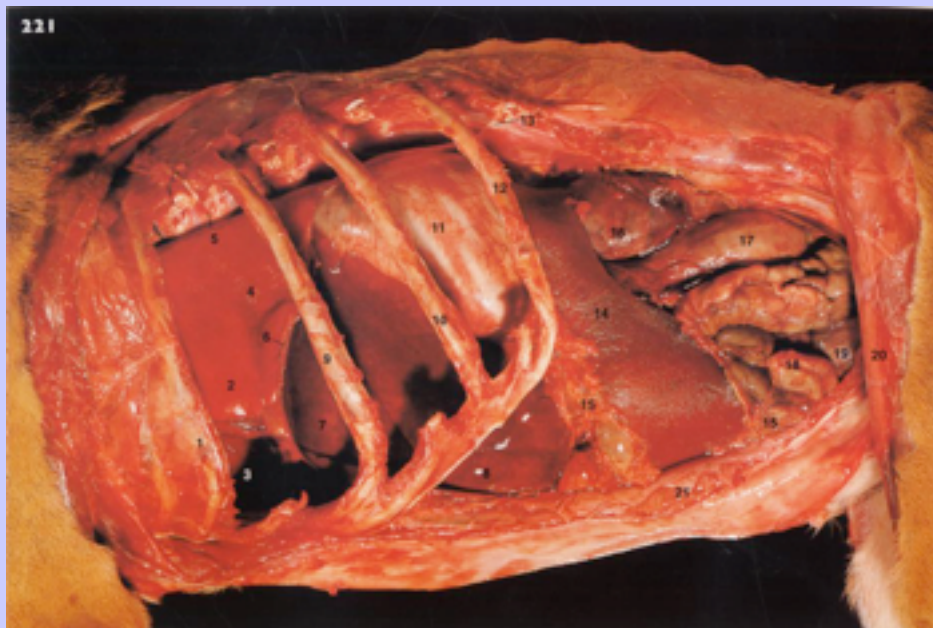
6.0.4 **Clinical Note**

3, 4 & 5 This dissection of the lateral abdominal wall represents the muscle layers encountered when performing a surgical lateral flank abdominal incision. The level of depth of the incision is judged by assessing the direction of the muscle fibres in each layer of muscle as it is cut through. The level of the muscle transversus abdominis (5) can also be judged by observing the presence of the ventral branches of the spinal nerves (7) running over its surface.

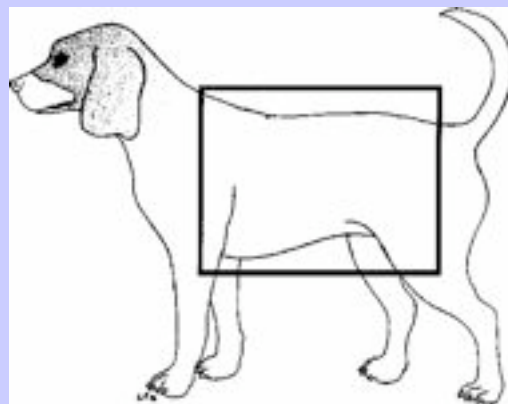
135

221 Left lateral aspect of the thoracic and abdominal regions of a dog. The thoracic and abdominal lateral walls have been removed, together with the diaphragm, to reveal the topography of the region.

136

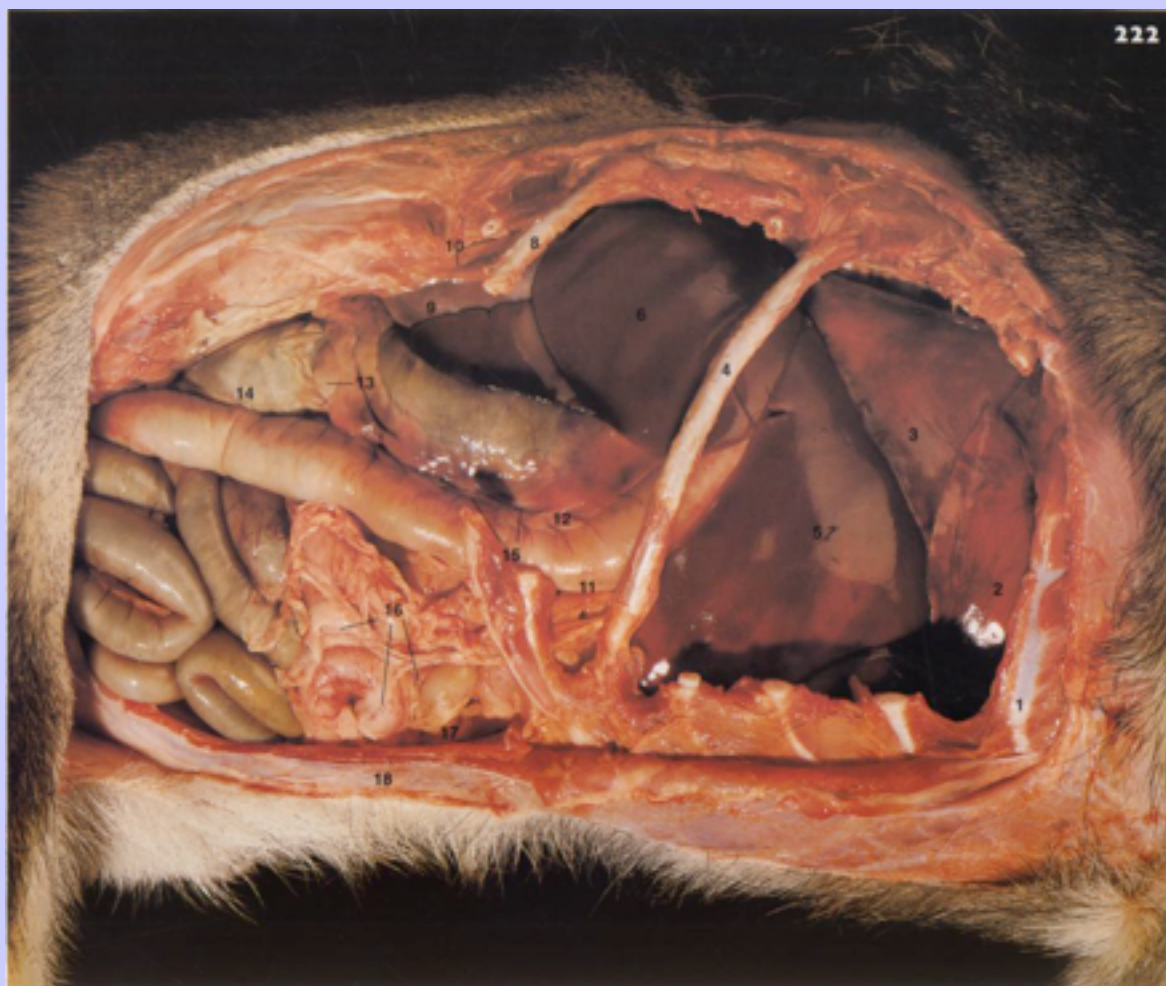


- | | |
|--|------------------------------|
| 1 Sixth rib | 11 Stomach |
| 2 Caudal part of cranial lobe of left lung | 12 Twelfth rib |
| 3 Heart | 13 Thirteenth (floating) rib |
| 4 Caudal lobe of left lung | 14 Spleen |
| 5 Sympathetic trunk | 15 Greater omentum |
| 6 Diaphragm (cut) | 16 Left kidney |
| 7 Left medial lobe | 17 Descending colon |
| 8 Left lateral lobe | 18 Jejunum |
| 9 Eighth rib | 19 Urinary bladder |
| 10 Tenth rib | 20 M. sartorius |
| | 21 M. rectus abdominis |

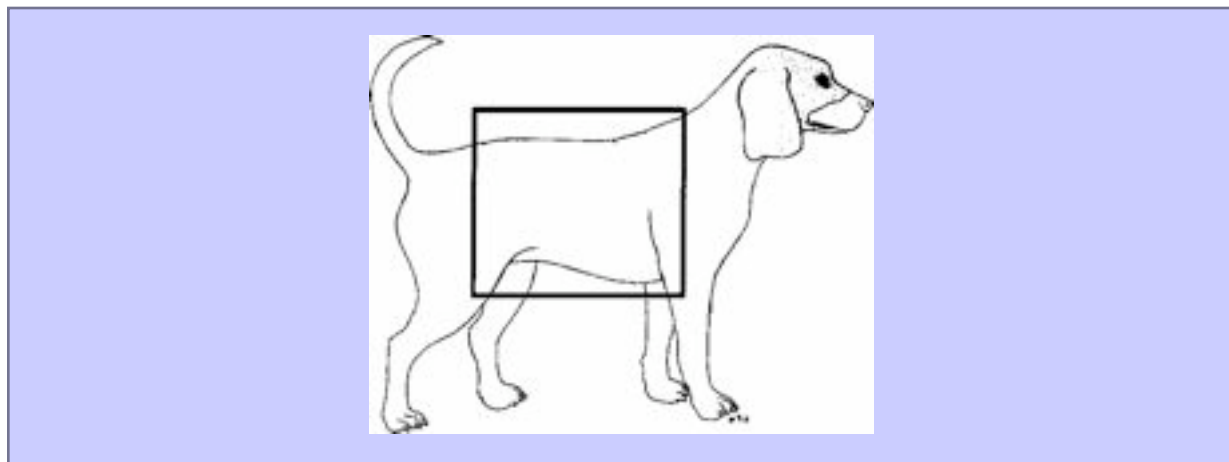


136

222 Lateral aspect of the thoracic and abdominal regions of a dog. The thoracic and abdominal lateral walls have been removed, together with the diaphragm, to reveal the topography of the region.

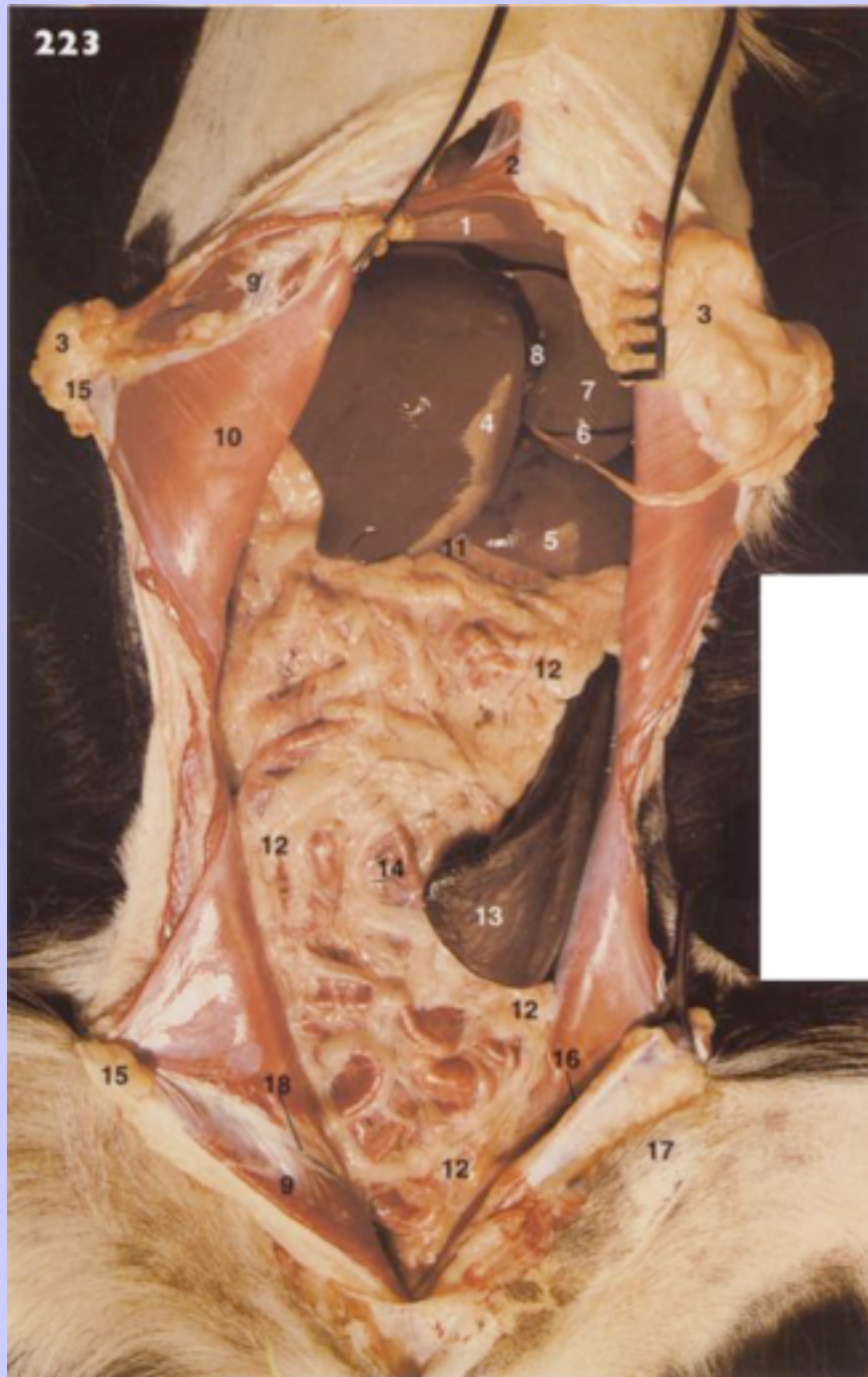


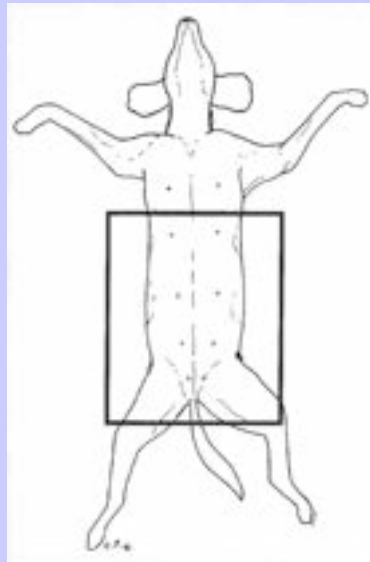
- | | |
|---------------------------------|------------------------------|
| 1 Eighth rib | 10 Thirteenth (floating) rib |
| 2 Middle lobe } of right lung | 11 Descending duodenum |
| 3 Caudal lobe } | 12 Pancreas |
| 4 Tenth rib | 13 Caecum |
| 5 Right medial lobe } of liver | 14 Descending colon |
| 6 Right lateral lobe } (against | 15 Mesoduodenum |
| 7 Caudate lobe } diaphragm) | 16 Greater omentum |
| 8 Twelfth rib | 17 Jejunum |
| 9 Right kidney | 18 M. rectus abdominis |



137

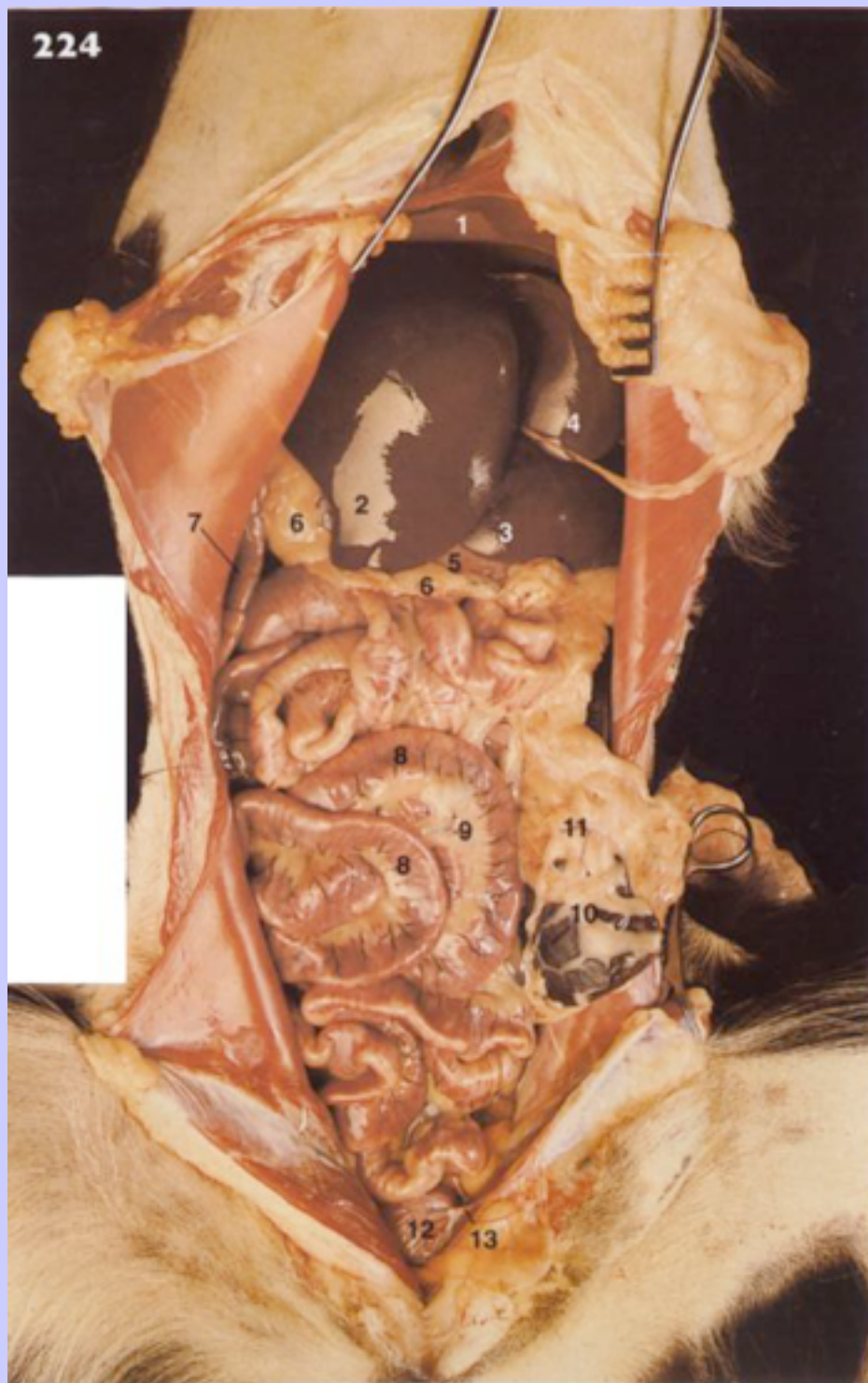
223 Ventral aspect of the opened abdomen of a male dog. The abdominal wall has been sectioned longitudinally in the midline ventrally, along the linea alba, and in a transverse direction at the level of the umbilicus. The greater omentum is seen *in situ*.

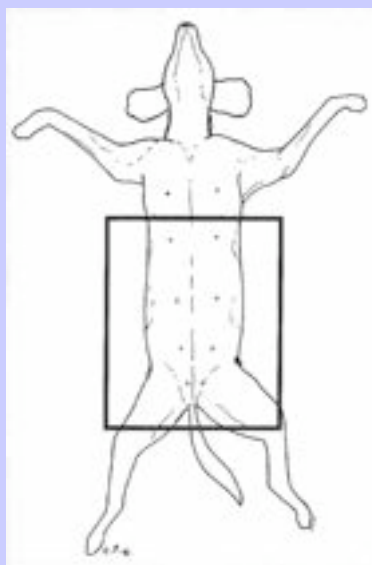




- | | | | |
|---|------------------------------------|----|--|
| 1 | Diaphragm | 10 | M. transversus abdominis |
| 2 | Xiphoid process of sternum | 11 | Greater curvature of stomach |
| 3 | Falciform ligament | 12 | Greater omentum |
| 4 | Right medial lobe | 13 | Spleen |
| 5 | Left lateral lobe | 14 | Jejunum through 12 |
| 6 | Quadrate lobe | 15 | Umbilicus |
| 7 | Left medial lobe | 16 | Linea alba |
| 8 | Gall bladder | 17 | Prepuce (reflected) |
| 9 | Deep aspect of M. rectus abdominis | 18 | Caudal deep epigastric artery and vein |

224 Ventral aspect of the open abdomen of a male dog. The greater omentum has been reflected cranially to reveal the coils of the intestinal tract.

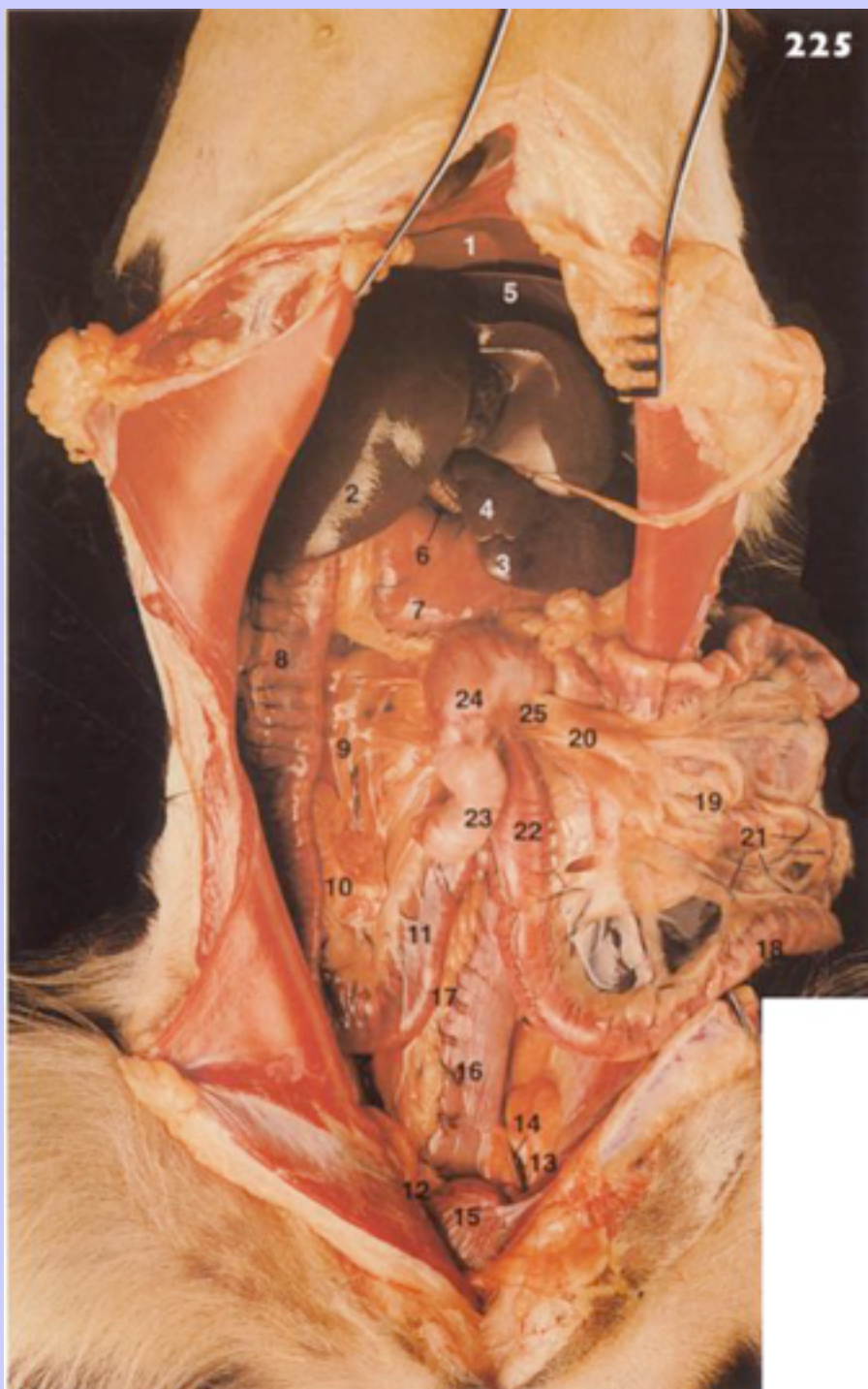




- | | | | |
|---|------------------------------|----|--------------------------------|
| 1 | Diaphragm | 8 | Jejunum |
| 2 | Right medial lobe | 9 | Great mesentery |
| 3 | Left lateral lobe | 10 | Spleen |
| 4 | Left medial lobe | 11 | Gastrosplenic ligament |
| 5 | Greater curvature of stomach | 12 | Urinary bladder |
| 6 | Greater omentum (reflected) | 13 | Median ligament of the bladder |
| 7 | Duodenum | | |

138

225 Ventral aspect of the open abdomen of a male dog. The greater omentum has been resected from the greater curvature of the stomach, and the coils of the jejunum have been displaced to reveal the ileocolic junction.

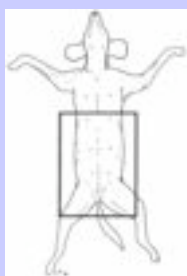




- | | |
|------------------------------|--|
| 1 Diaphragm | 15 Urinary bladder |
| 2 Right medial lobe | 16 Descending colon |
| 3 Left lateral lobe | 17 Mesocolon |
| 4 Quadrate lobe | 18 Jejunum |
| 5 Left medial lobe | 19 Great mesentery |
| 6 Lesser curvature | 20 Mesenteric lymph nodes under fat |
| 7 Greater curvature | 21 Branches of cranial mesenteric arteries and veins |
| 8 Descending duodenum | 22 Ileum |
| 9 Mesoduodenum | 23 Caecum |
| 10 Right lobe of pancreas | 24 Ascending colon |
| 11 Ascending duodenum | 25 Root of mesentery |
| 12 Internal inguinal opening | |
| 13 Vaginal process | |
| 14 Testicular vein | |

226 Ventral aspect of the opened abdomen of a male dog. The intestine has been removed from the level of the ascending duodenum to the ascending colon, and the spleen has been displaced to the left.



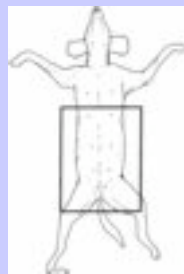


- 1 Diaphragm
- 2 Liver
- 3 Parietal surface of stomach
- 4 Descending duodenum
- 5 Ascending duodenum
- 6 Pancreas in mesoduodenum
- 7 Ascending colon
- 8 Transverse colon
- 9 Descending colon
- 10 Mesocolon
- 11 Hilus of spleen
- 12 Gastrosplenic ligament
- 13 Urinary bladder

139

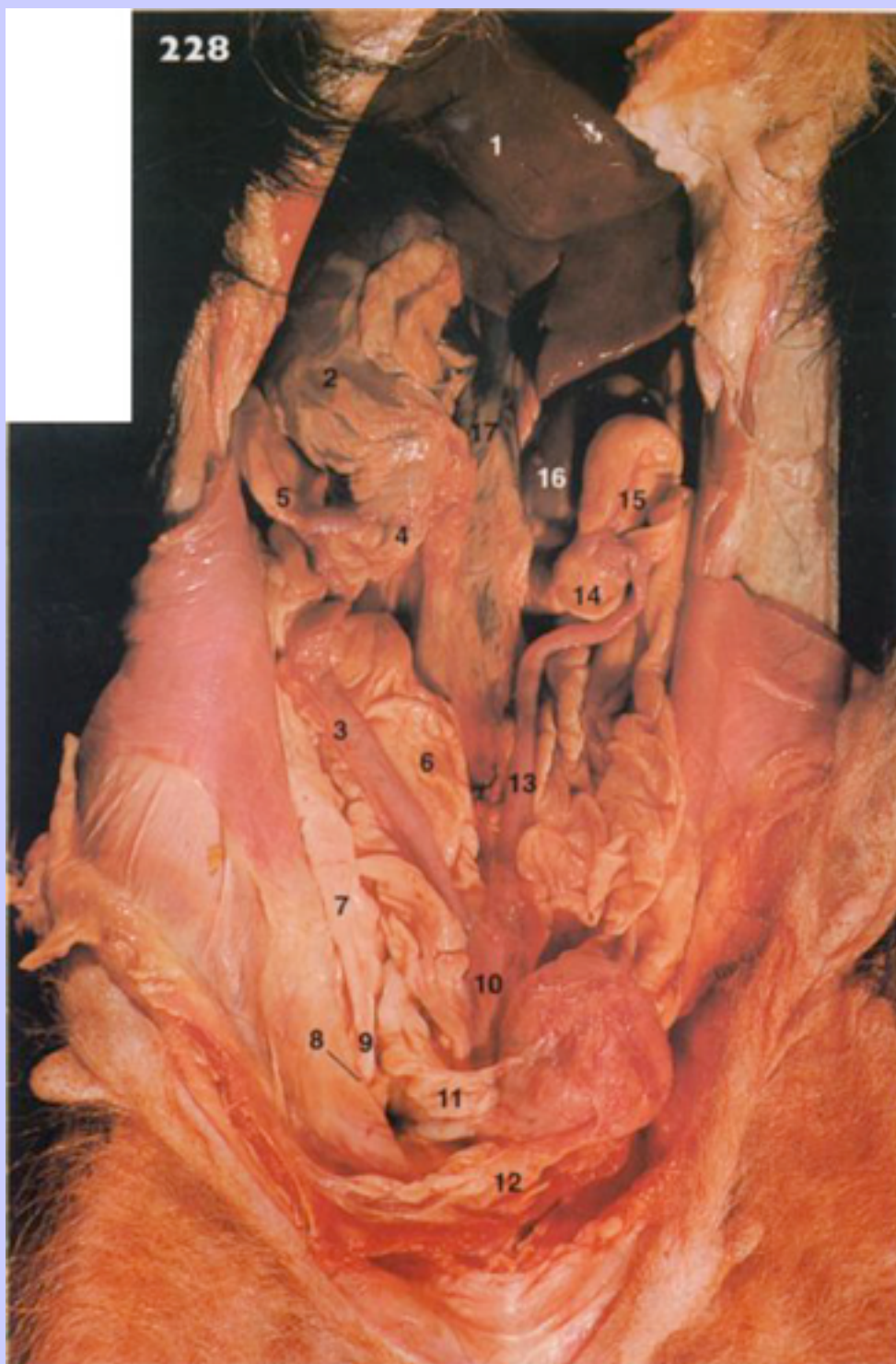
227 Ventral aspect of the opened abdomen of a male dog. The entire intestinal tract has been removed from the level of the pylorus to the descending colon at the pelvic inlet.





- | | | | |
|---|------------------------------------|----|-------------------------------|
| 1 | Diaphragm | 8 | Testicular vein |
| 2 | Right medial lobe | 9 | Descending colon (transected) |
| 3 | Caudate process
of caudate lobe | 10 | Urinary bladder |
| | } of liver | 11 | Left kidney |
| 4 | Right kidney | 12 | Adrenal gland |
| 5 | Testicular artery and vein | 13 | Pylorus |
| 6 | Ureters | 14 | Fundus |
| 7 | Caudal vena cava | 15 | Duodenum (transected) |
| | | | } of stomach |

228 Ventral aspect of the opened abdomen of a bitch. The gastrointestinal tract has been removed to reveal the urogenital tract *in situ*.



- | | |
|--------------------------------------|--|
| 1 Liver | 9 Vaginal process |
| 2 Caudal pole of right kidney | 10 Uterine body |
| 3 Right uterine horn | 11 Lateral ligament |
| 4 Right ovary within ovarian bursa | 12 Median ligament |
| 5 Suspensory ligament | 13 Left uterine horn |
| 6 Mesometrium | 14 Left ovary within ovarian bursa |
| 7 Round ligament of uterus | 15 Mesovarium with ovarian blood vessels |
| 8 Internal opening of inguinal canal | 16 Left kidney |
| | 17 Caudal vena cava |



140

229 Ventral aspect of a section made in the dorsal plane through the thoracic and cranial abdominal region of a dog. The section has been made through the vertebral bodies to demonstrate the topography of the diaphragm and the cranial abdominal organs.



- 1 Vertebral body
- 2 Crura of diaphragm
- 3 Right caudal lobe of lung
- 4 Liver
- 5 Right kidney
- 6 Renal pelvis
- 7 Ureter
- 8 Adrenal glands
- 9 Left kidney
- 10 Renal artery and vein
- 11 Phrenicoabdominal artery and vein
- 12 Spleen
- 13 Stomach
- 14 Left caudal lobe of lung
- 15 Ribs

230 Extended field of view ultrasound scan of left flank of a dog to image organs indicated.



- 1 Liver
- 2 Spleen
- 3 Kidney
- 4 Bowel

141

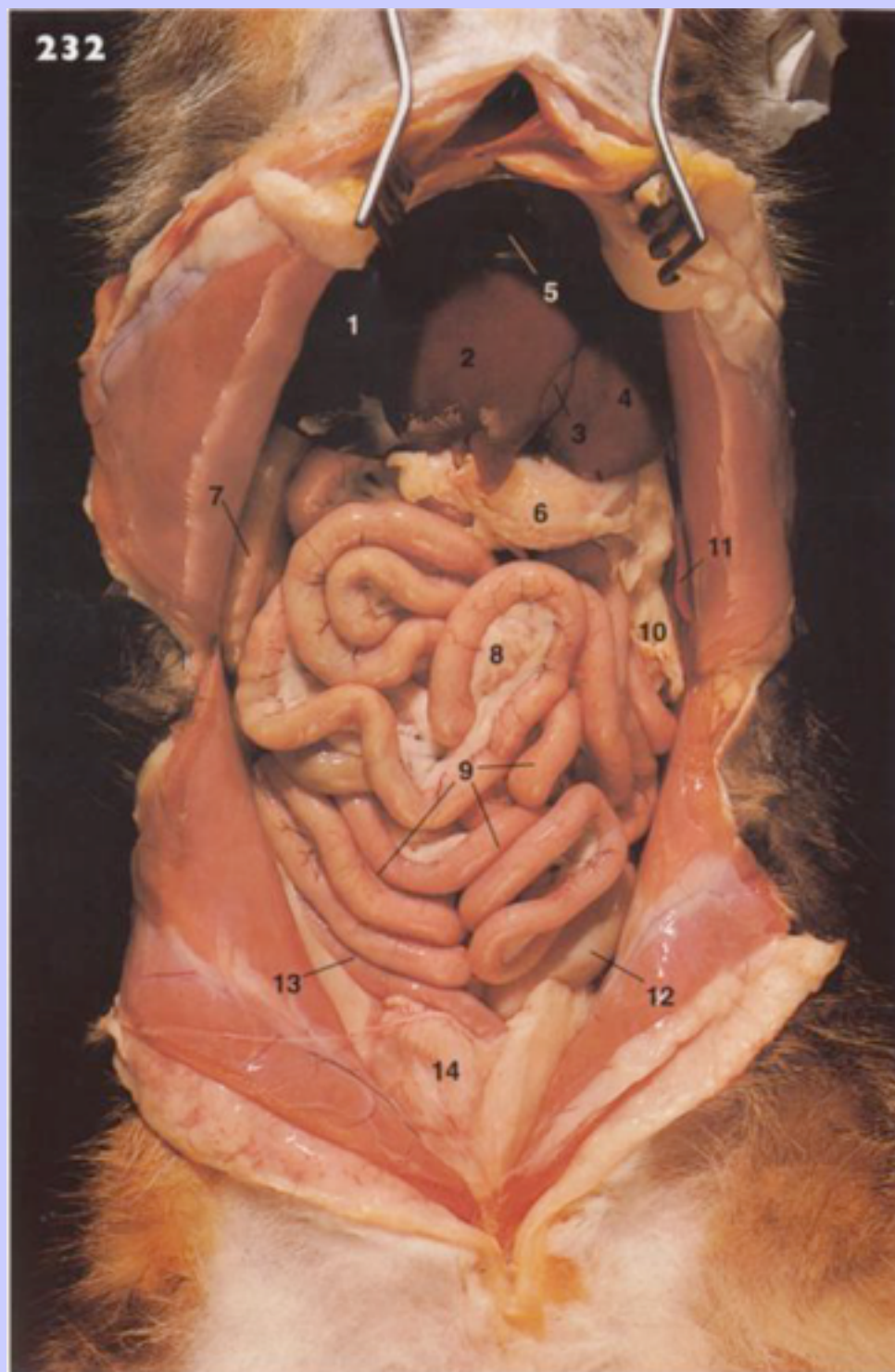
231 Ventral aspect of the opened abdomen of a cat. The muscles of the abdominal wall have been reflected to reveal the abdominal contents covered by the greater omentum.

142



- | | | | |
|----|---|----|--------------------------------|
| 1 | Xiphoid process of sternum | 11 | Jejunum |
| 2 | Fat-laden falciform ligament | 12 | M. obliquus externus, |
| 3 | Right medial lobe | | M. obliquus internus and |
| 4 | Left lateral lobe | | M. transversus abdominis |
| | } of liver | | |
| 5 | Gall bladder | 13 | M. rectus abdominis |
| 6 | Quadrangle lobe of liver | 14 | Urinary bladder |
| 7 | Stomach | 15 | Median ligament of bladder |
| 8 | Greater omentum | 16 | Deep caudal epigastric vessels |
| 9 | Descending duodenum | | |
| 10 | Parietal peritoneum overlying
deep rectal sheath | | |

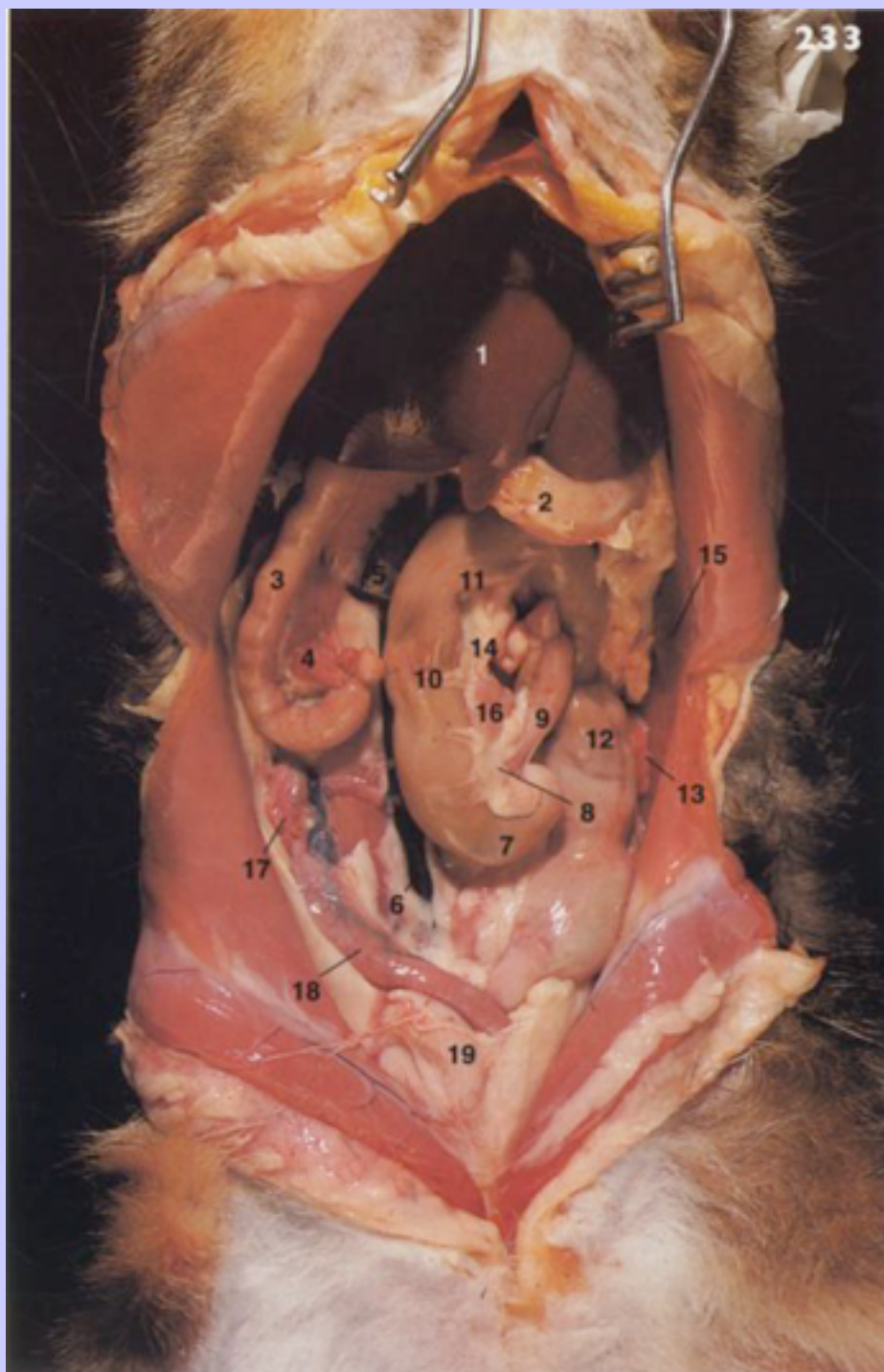
232 Ventral aspect of the opened abdomen of a cat. The greater omentum has been resected at its attachment to the greater curvature of the stomach.



1	Right lateral lobe	} of liver	8	Great mesentery
2	Right medial lobe		9	Jejunum
3	Quadrante lobe		10	Gastrosplenic ligament
4	Left lateral lobe		11	Spleen
5	Gall bladder		12	Descending colon
6	Greater curvature of stomach		13	Right uterine horn
7	Descending duodenum		14	Urinary bladder

142

233 Ventral aspect of the opened abdomen of a female cat. The small intestine has been resected at the level of the descending duodenum and the terminal portion of the ileum.



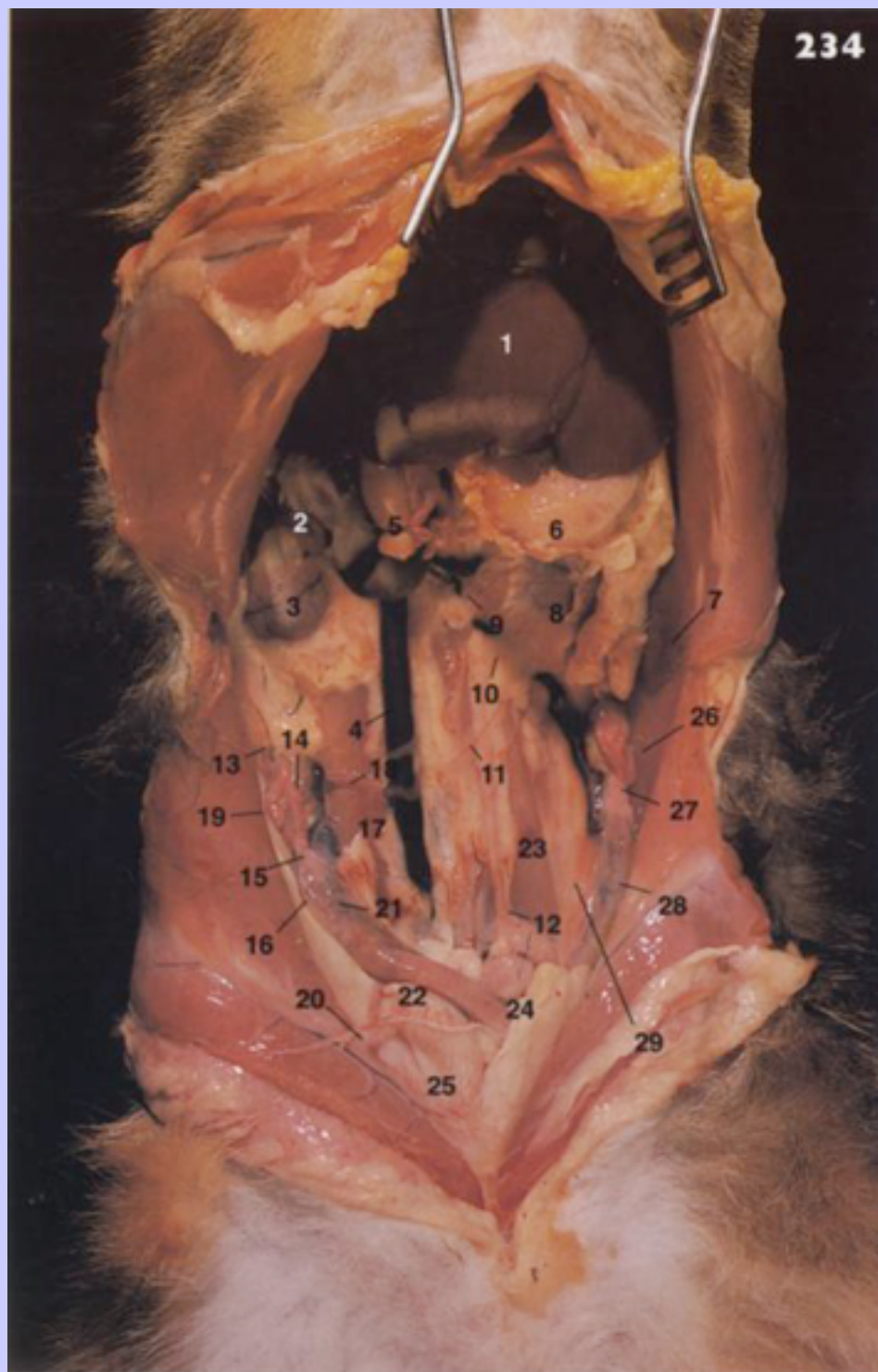
- 1 Liver
- 2 Stomach
- 3 Duodenum
- 4 Right lobe of pancreas (in mesoduodenum)
- 5 Caudate lobe of liver
- 6 Caudal vena cava
- 7 Caecum
- 8 Ileocolic junction
- 9 Ileum
- 10 Ascending colon
- 11 Transverse colon
- 12 Descending colon
- 13 Left ovary
- 14 Root of mesentery
- 15 Spleen
- 16 Mesenteric lymph nodes
- 17 Right ovary
- 18 Right uterine horn
- 19 Urinary bladder

6.0.5

Clinical Note

- 7 Note that the feline caecum is not coiled upon itself as is found in the dog ([Fig. 225](#), 23).

234 Ventral aspect of the opened abdomen of a female cat. The intestinal tract has been removed to reveal the urogenital tract *in situ*.



- | | |
|-----------------------------------|--|
| 1 Liver | 16 Proper ligament of ovary |
| 2 Caudate lobe of l | 17 Mesovarium |
| 3 Right kidney | 18 Ovarian artery and vein |
| 4 Caudal vena cava | 19 Uterine tube |
| 5 Duodenum (cut) | 20 Round ligament running to
internal inguinal ring |
| 6 Stomach | 21 Uterine branch of l8 |
| 7 Spleen | 22 Right uterine horn |
| 8 Left kidney | 23 M. psoas |
| 9 Renal vein | 24 Descending colon (cut) |
| 10 Ovarian vessel | 25 Urinary bladder |
| 11 Aorta | 26 Lateral aspect of left ovary |
| 12 Ureter | 27 Uterine tube |
| 13 Suspensory ligament } or right | 28 Left uterine horn |
| 14 Medial aspect } ovary | 29 Mesometrium |
| 15 Entrance to ovarian bursa | |

143

235 Dorsal aspect of the kidney of a dog.

144

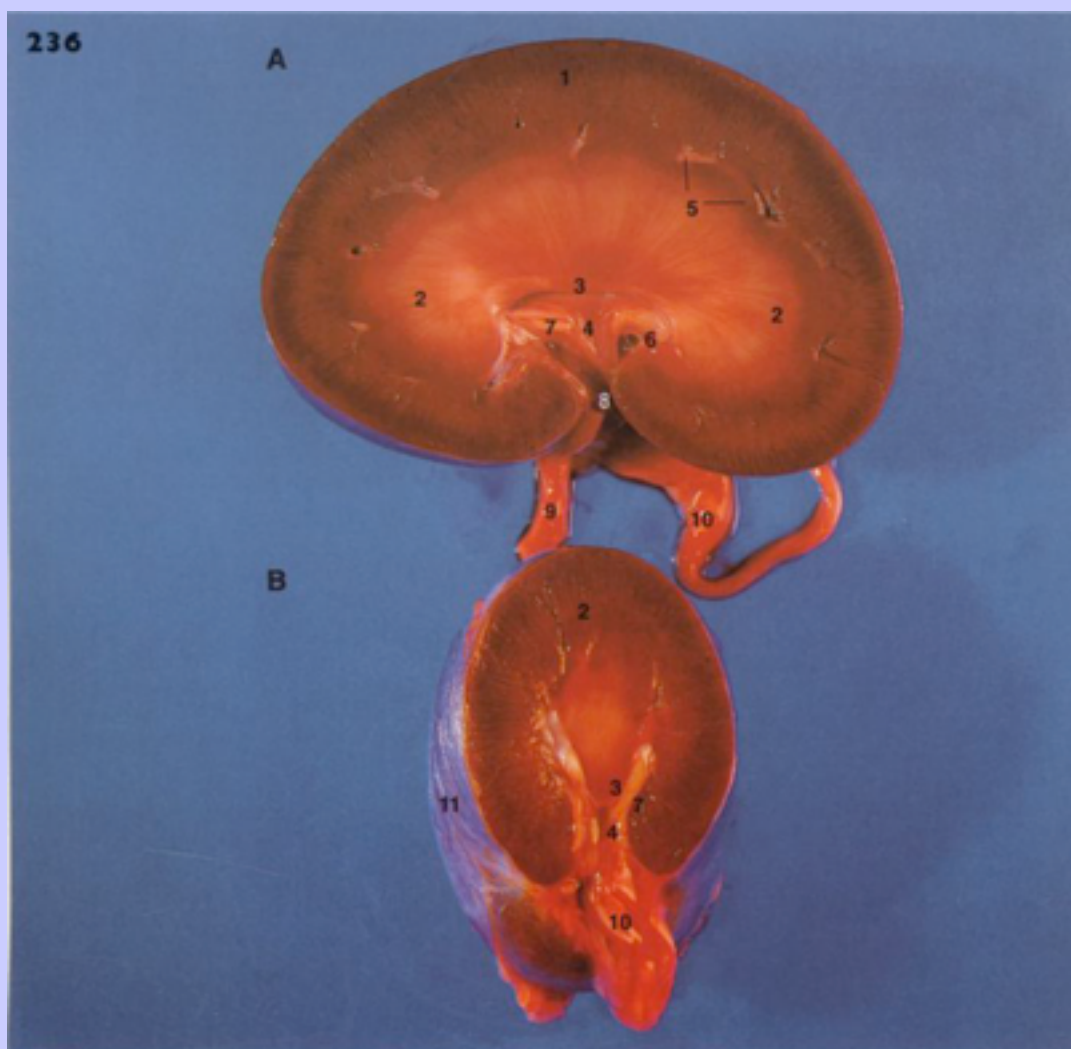


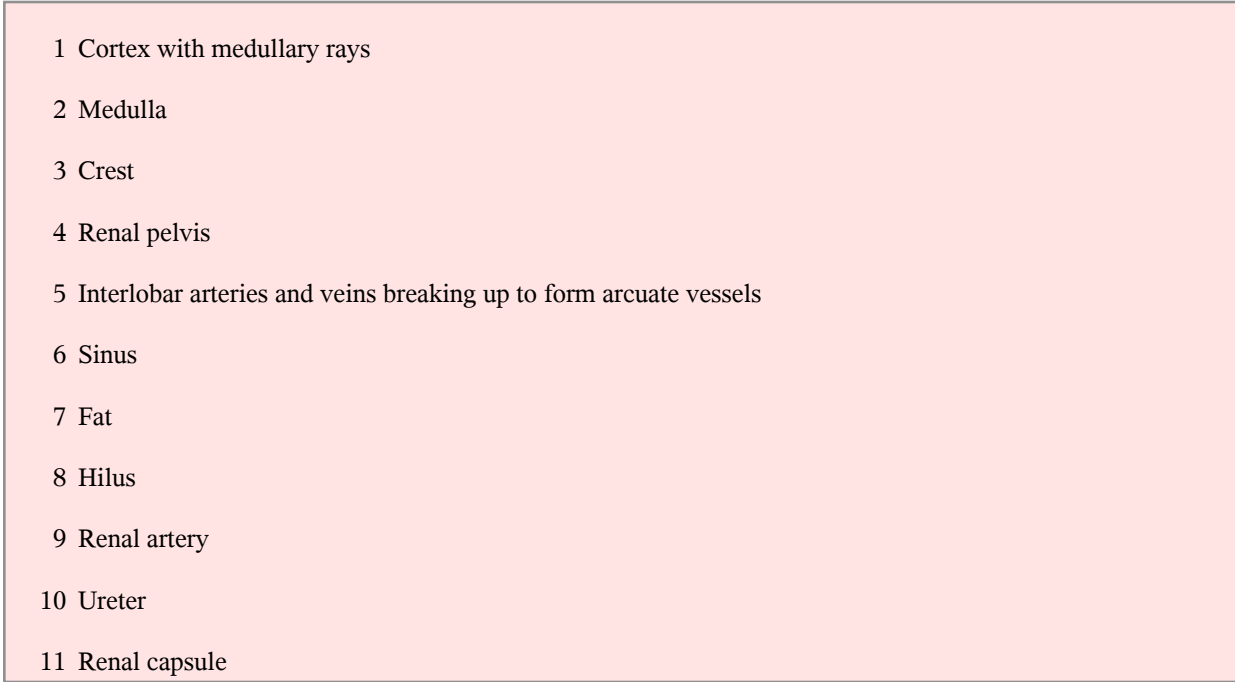
1 Convex lateral border

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- 2 Cranial pole
- 3 Medial border
- 4 Hilus
- 5 Renal artery
- 6 Renal vein
- 7 Ureter
- 8 Caudal pole

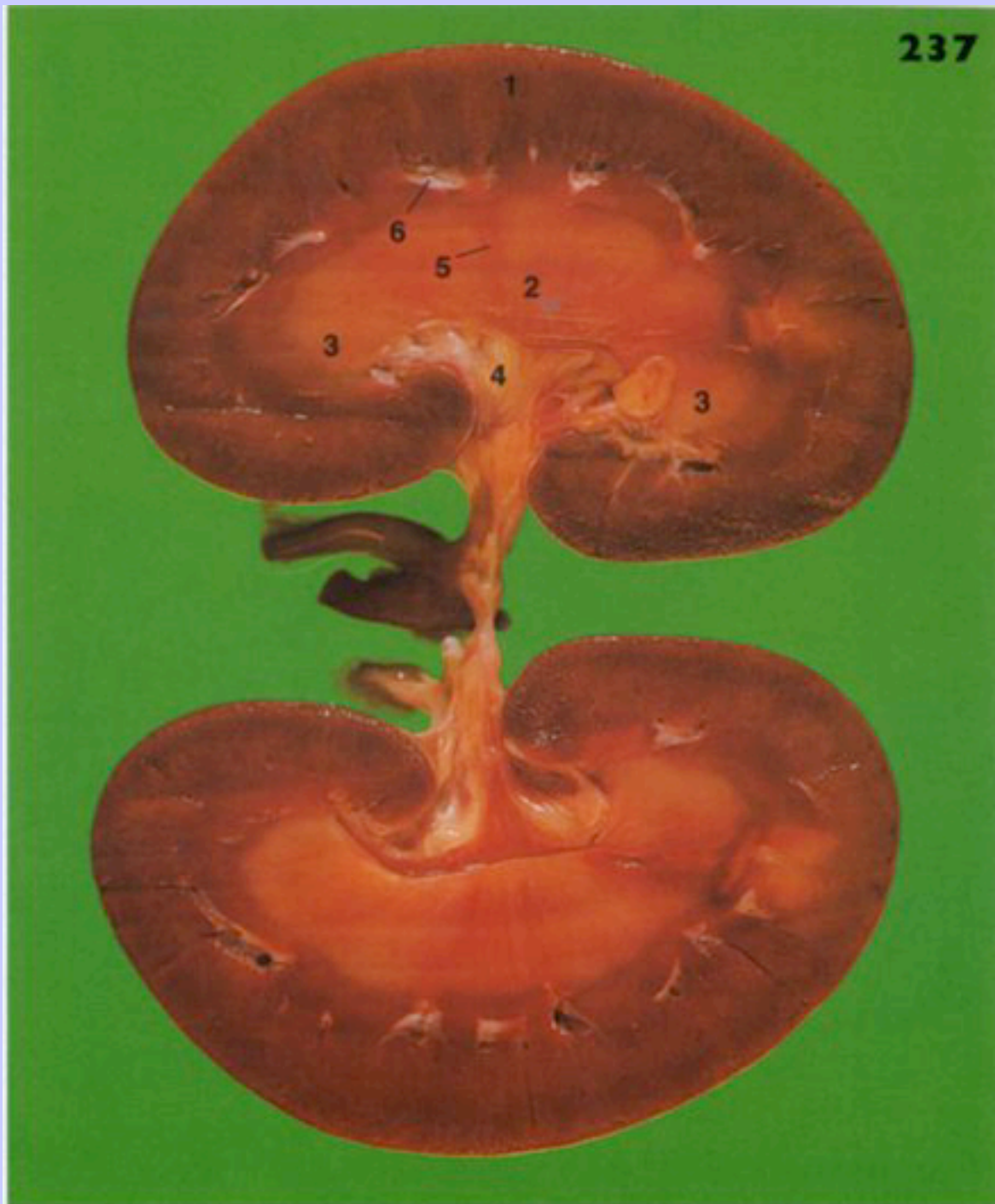
236 Dorsal aspect of a midfrontal section (A) and cross section (B) of the kidney of a dog.



- 
- 1 Cortex with medullary rays
 - 2 Medulla
 - 3 Crest
 - 4 Renal pelvis
 - 5 Interlobar arteries and veins breaking up to form arcuate vessels
 - 6 Sinus
 - 7 Fat
 - 8 Hilus
 - 9 Renal artery
 - 10 Ureter
 - 11 Renal capsule

144

237 Frontal section in the dorsal plane of the kidney of a dog.

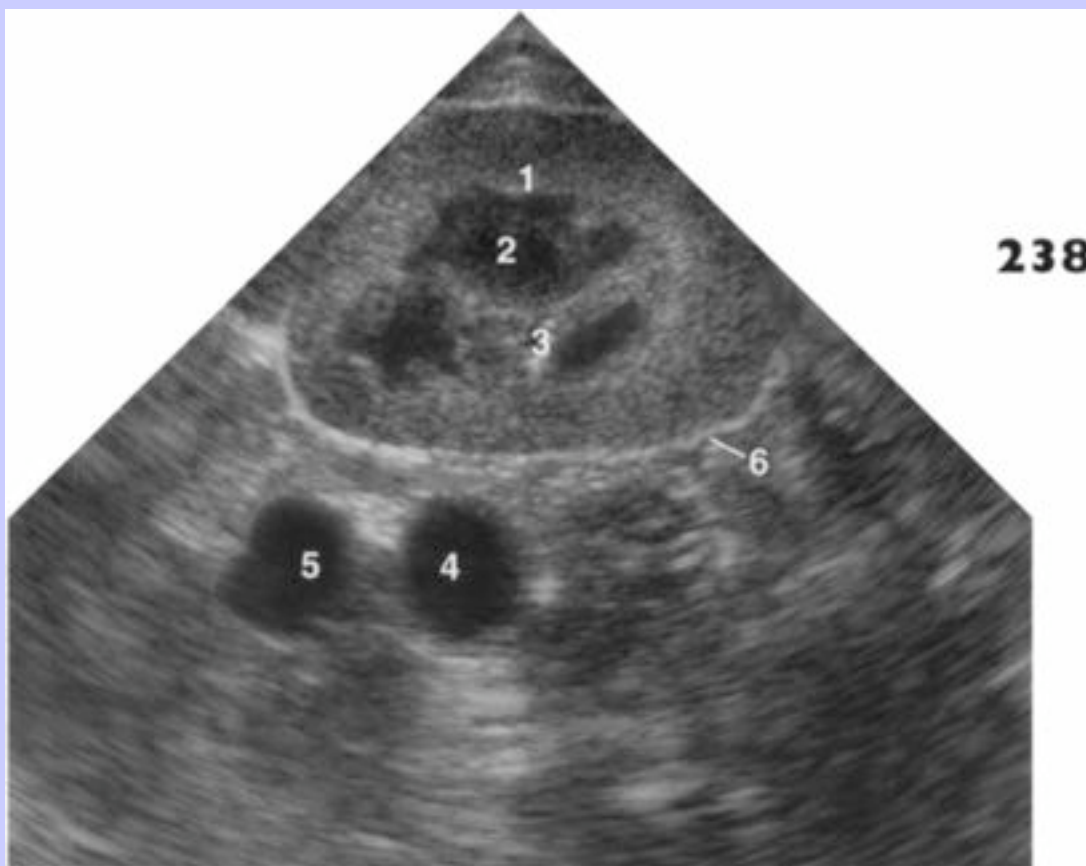


1 Cortex

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- 2 Pyramid
- 3 Medulla
- 4 Fat (in sinus)
- 5 Interlobar vessels
- 6 Arcuate vessels

238 Transverse ultrasound scan of the kidney of a dog, illustrating the contrast between the echogenicity of the cortex and that of the medulla.

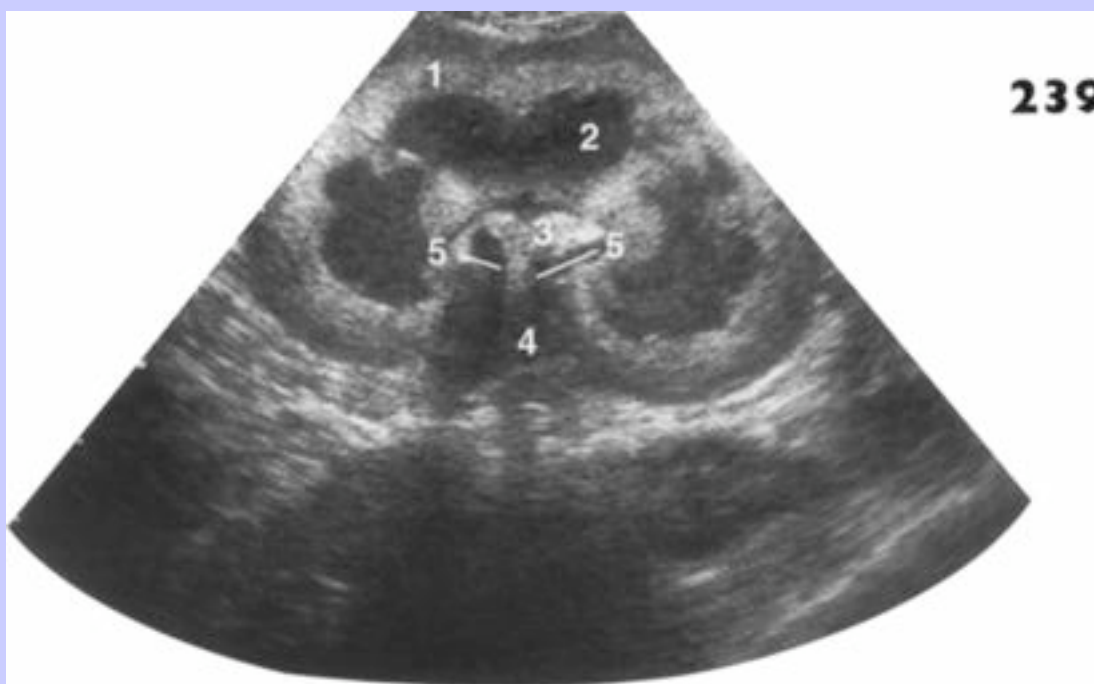


- 1 Renal cortex
- 2 Renal medulla
- 3 Renal pelvis
- 4 Aorta

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- 5 Vena cava
- 6 Renal capsule

239 Ultrasound scan of the kidney of a dog, made in the dorsal plane, illustrating the contrast between the echogenicity of the cortex and that of the medulla. The renal pelvis produces strong echoes and appears white at the centre of the kidney outline.



- 1 Renal cortex
- 2 Renal medulla
- 3 Renal pelvis
- 4 Hilus
- 5 Renal vessels

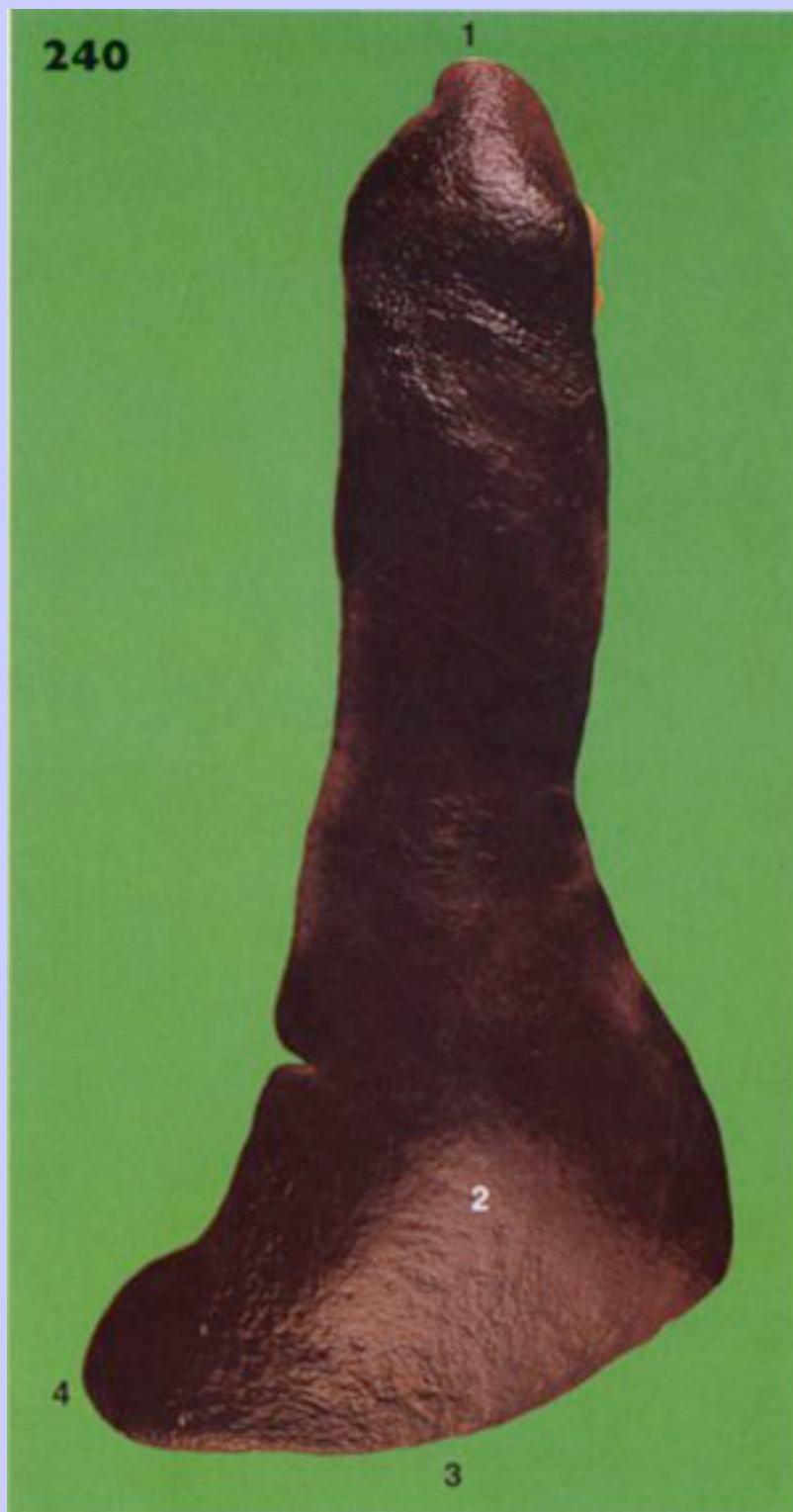
6.0.6 Clinical Note

This scan is in a plane similar to that in the gross anatomical sectioned kidney.

145

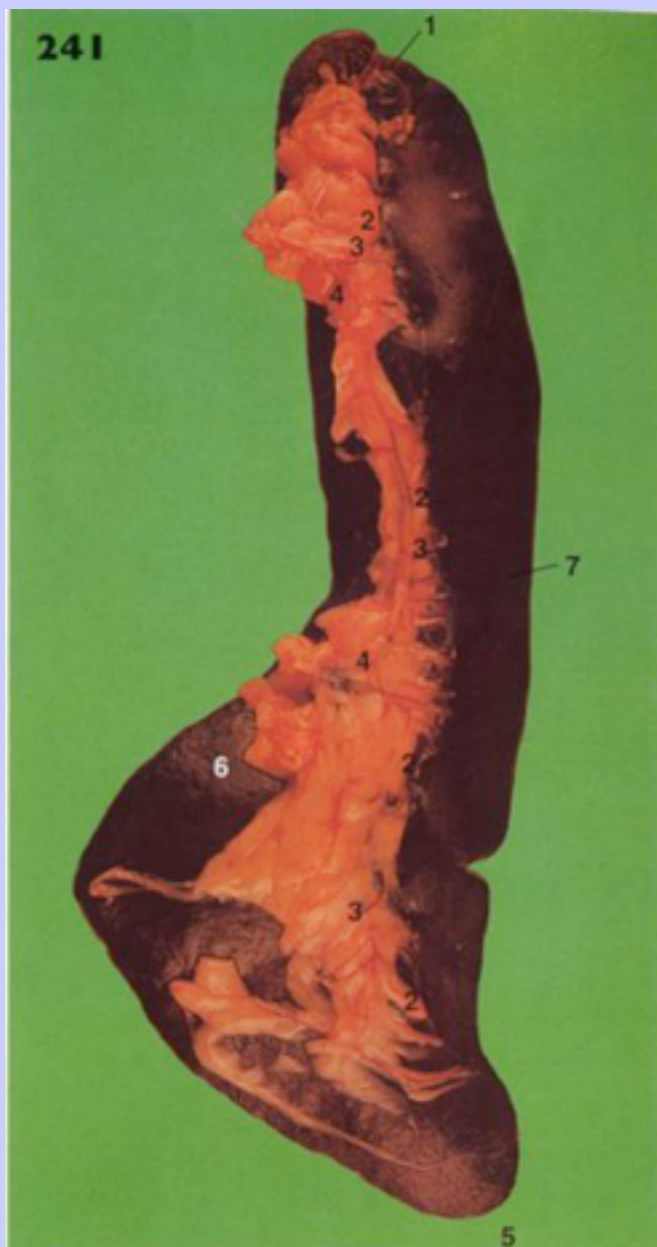
240 Parietal surface of the spleen of a dog.

146



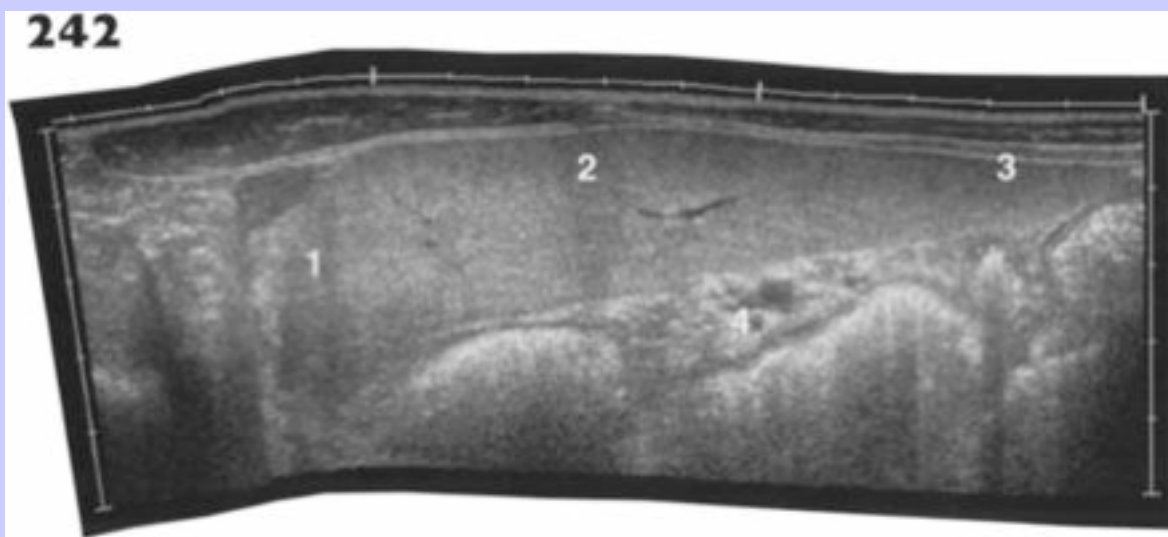
- 1 Dorsal extremity
- 2 Parietal surface
- 3 Ventral extremity
- 4 Cranially directed tip

241 Visceral surface of the spleen of a dog.



- 1 Dorsal extremity
- 2 Hilus
- 3 Attachment of gastrosplenic ligament
- 4 Branches of splenic artery and vein
- 5 Ventral extremity
- 6 Intestinal surface
- 7 Gastric surface

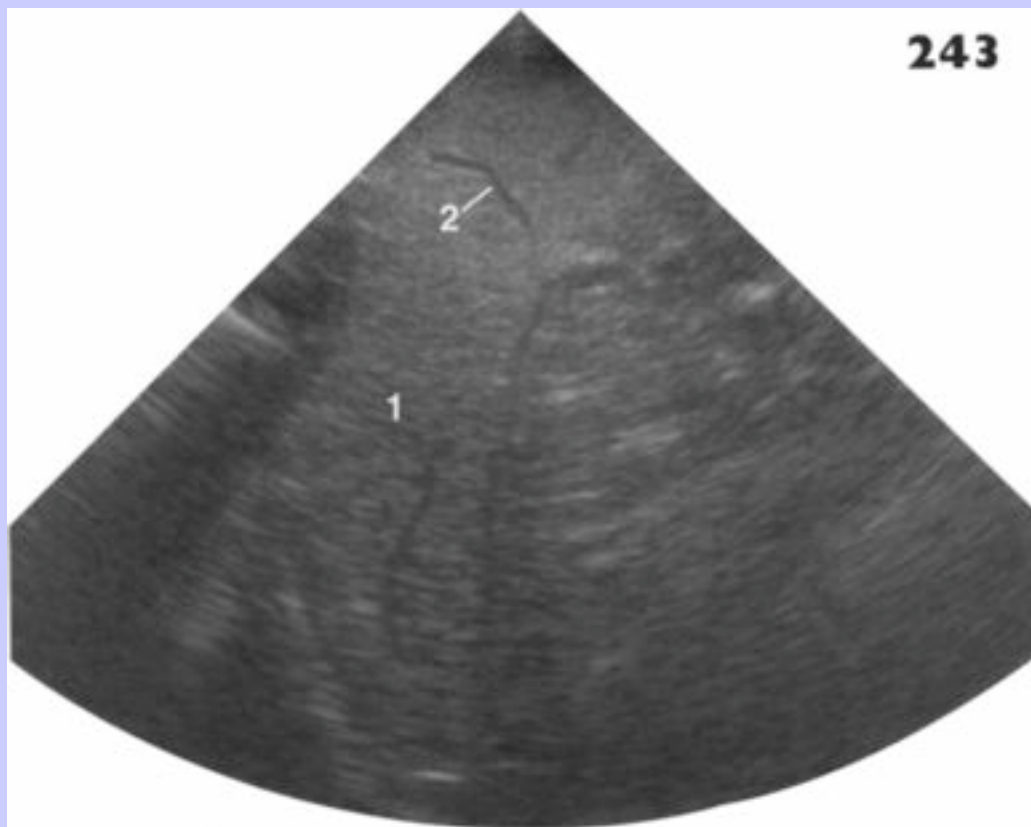
242 Extended field of view ultrasound scan of left flank of a dog to image entire spleen.



- 1 Dorsal extremity
- 2 Body of spleen
- 3 Ventral extremity
- 4 Bowel

146

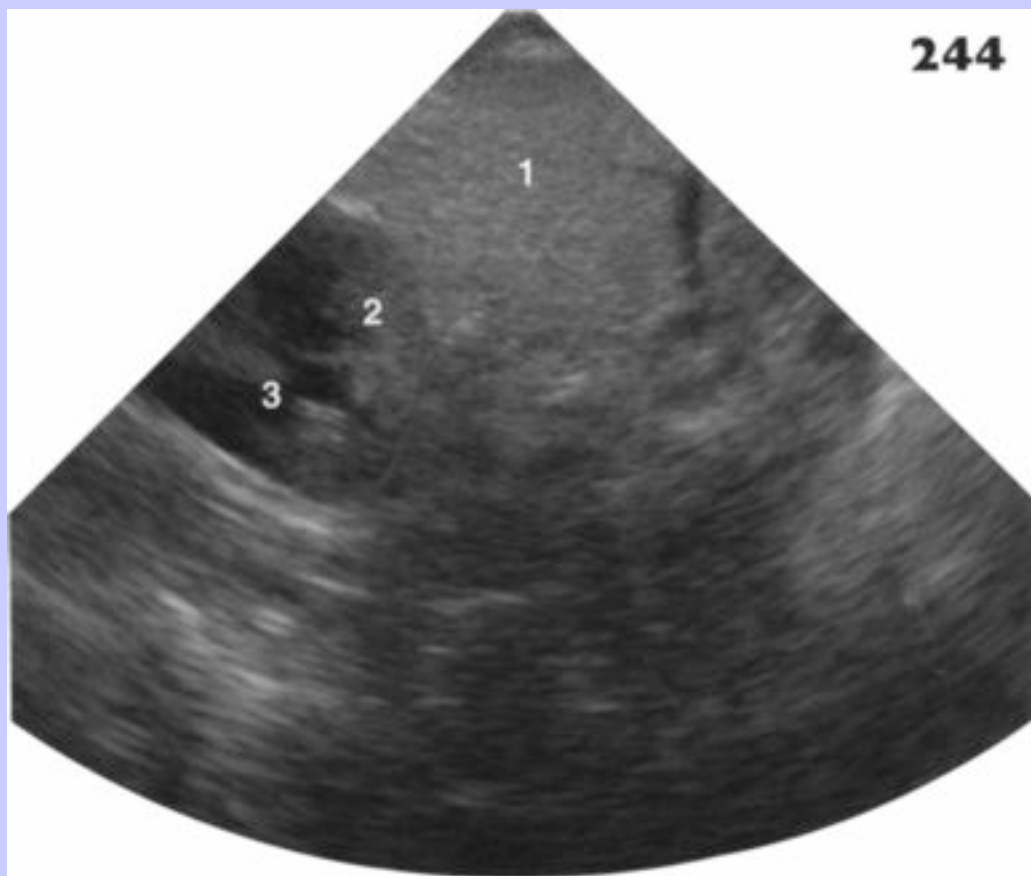
243 Ultrasound scan of the spleen of a dog, showing the splenic vessels running through the splenic tissue.



1 Spleen

2 Splenic vessels

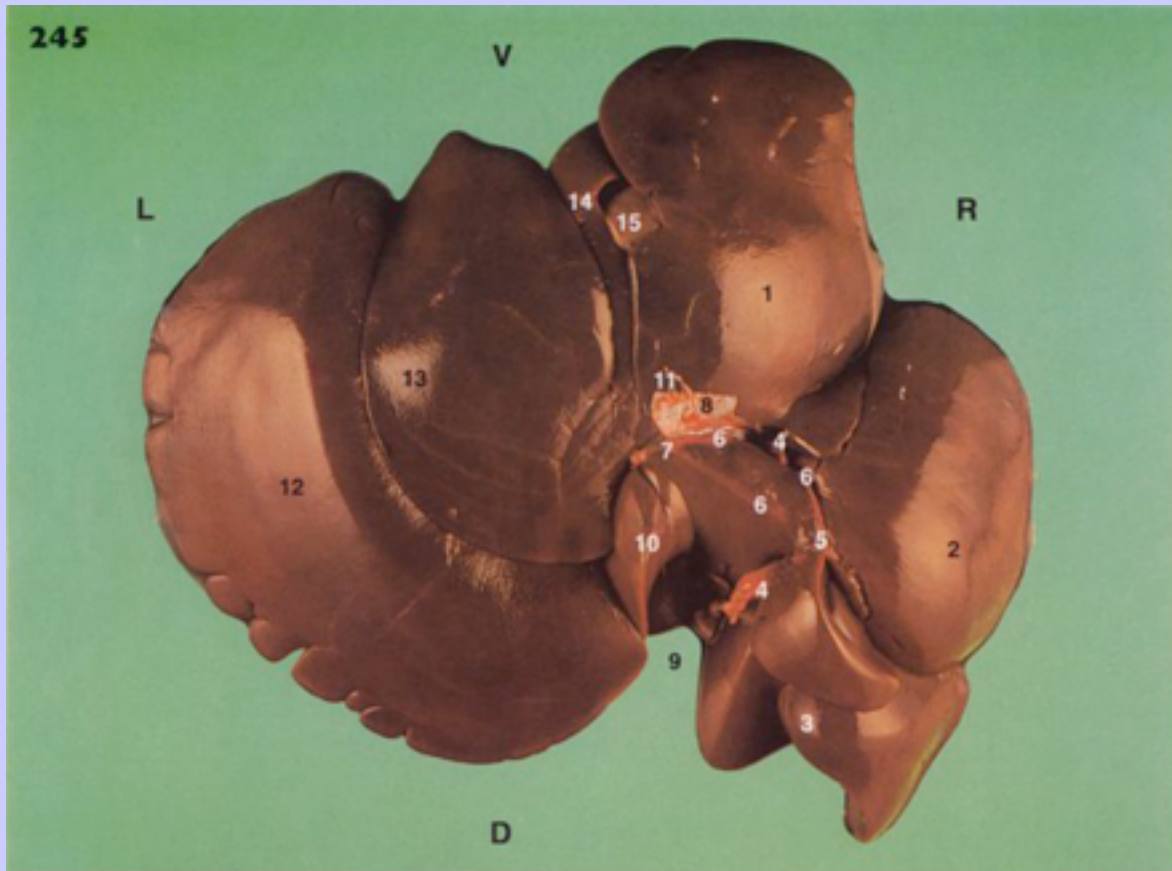
244 Ultrasound scan of the kidney and spleen of a dog, illustrating the contrast in echogenicity between these organs. On the left, the spleen can be seen to abutt onto the kidney.



- 1 Spleen
- 2 Renal cortex
- 3 Renal medulla

147

245 Diaphragmatic surface of the liver of a dog. Orientation ventrally (V), dorsally (D), left (L) and right (R) is indicated.



- 1 Right medial lobe
- 2 Right lateral lobe
- 3 Caudate lobe
- 4 Caudal vena cava
- 5 Right triangular ligament
- 6 Coronary ligament
- 7 Left triangular ligament
- 8 Fragment of diaphragm
- 9 Oesophageal notch

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- 10 Papillary process of caudate lobe
- 11 Falciform ligament
- 12 Left lateral lobe
- 13 Left medial lobe
- 14 Quadrate lobe
- 15 Gall bladder

246 Visceral surface of the liver of a dog. Orientation ventrally (V), dorsally (D), left (L) and right (R) is indicated.



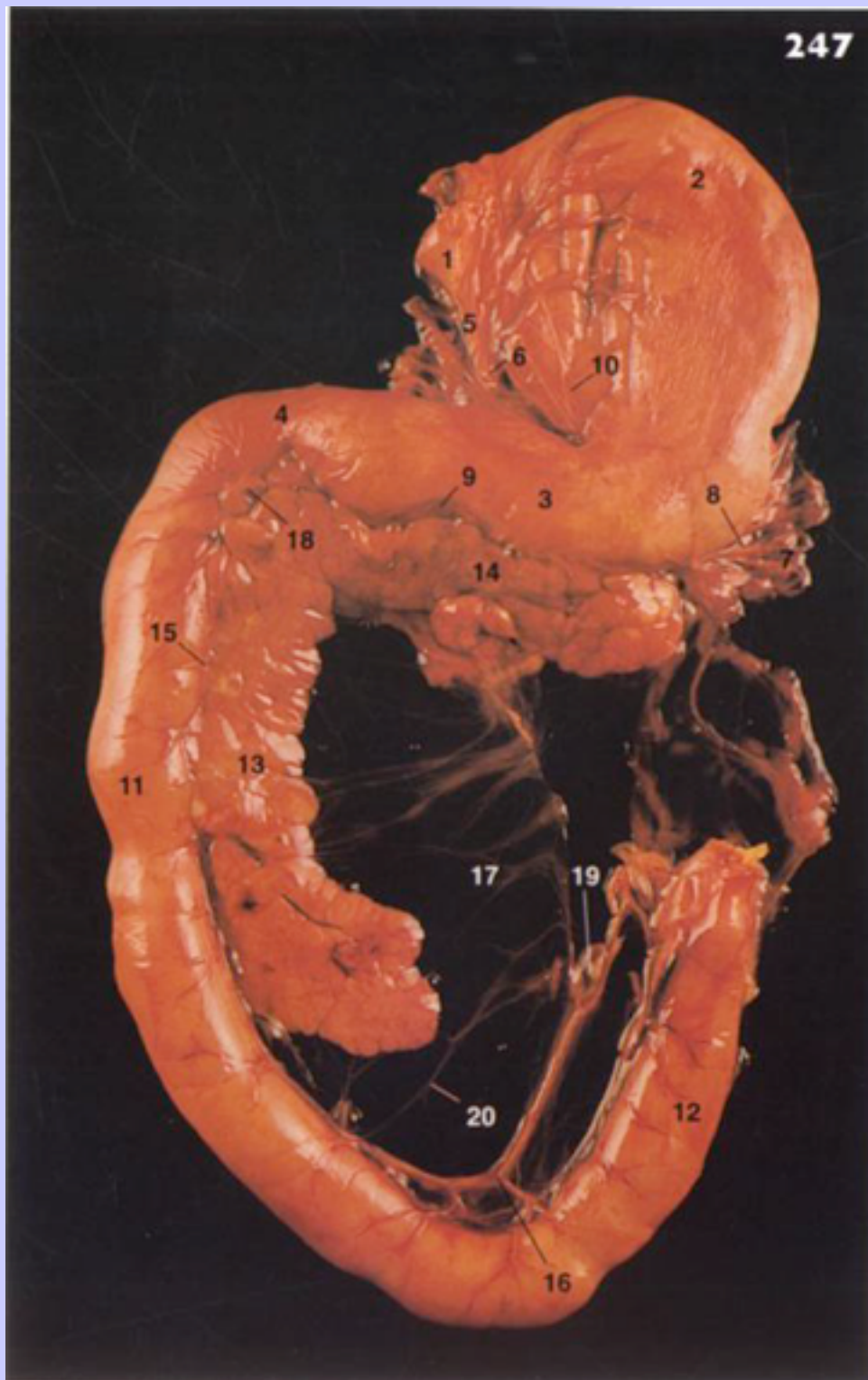
- 1 Left medial lobe
- 2 Left lateral lobe
- 3 Lesser omentum (hepatogastric ligament)

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- 4 Papillary process of caudate lobe
- 5 Oesophageal notch
- 6 Right lateral lobe
- 7 Caudate process of caudate lobe
- 8 Renal fossa
- 9 Hepatorenal ligament
- 10 Lesser omentum (hepatoduodenal ligament)
- 11 Caudal vena cava
- 12 Right medial lobe
- 13 Gall bladder
- 14 Quadrate lobe
- 15 Cystic duct
- 16 Hepatic ducts
- 17 Bile duct
- 18 Portal vein
- 19 Hepatic artery
- 20 Gastroduodenal artery

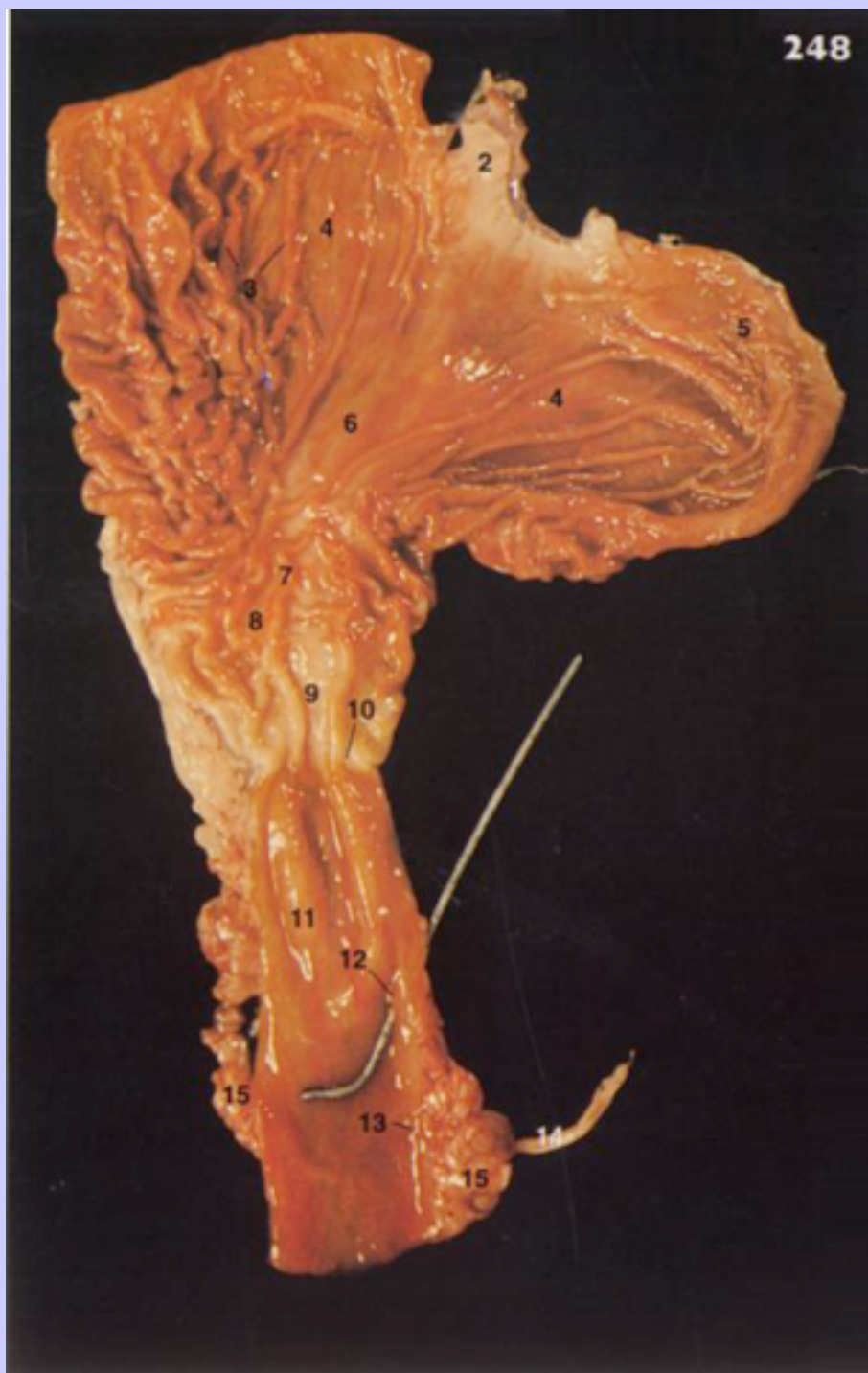
148

247 Ventral aspect of the stomach, duodenum and pancreas of a dog.



- | | | |
|-------------------------------|---|---------------|
| 1 Cardia | 13 Right lobe | } of pancreas |
| 2 Fundus | 14 Left lobe | |
| 3 Pyloric antrum | 15 Cranial pancreaticoduodenal artery (from coeliac artery) | |
| 4 Pylorus | 16 Caudal pancreaticoduodenal artery (from cranial mesenteric artery) | |
| 5 Lesser omentum | 17 Mesoduodenum | |
| 6 Left gastric artery | 18 Duodenal lymph node | |
| 7 Greater omentum | 19 Mesenteric lymph node | |
| 8 Left gastroepiploic artery | 20 Gastroduodenal branches of autonomic nerve fibres | |
| 9 Right gastroepiploic artery | | |
| 10 Lymphatic vessels | | |
| 11 Descending duodenum | | |
| 12 Ascending duodenum | | |

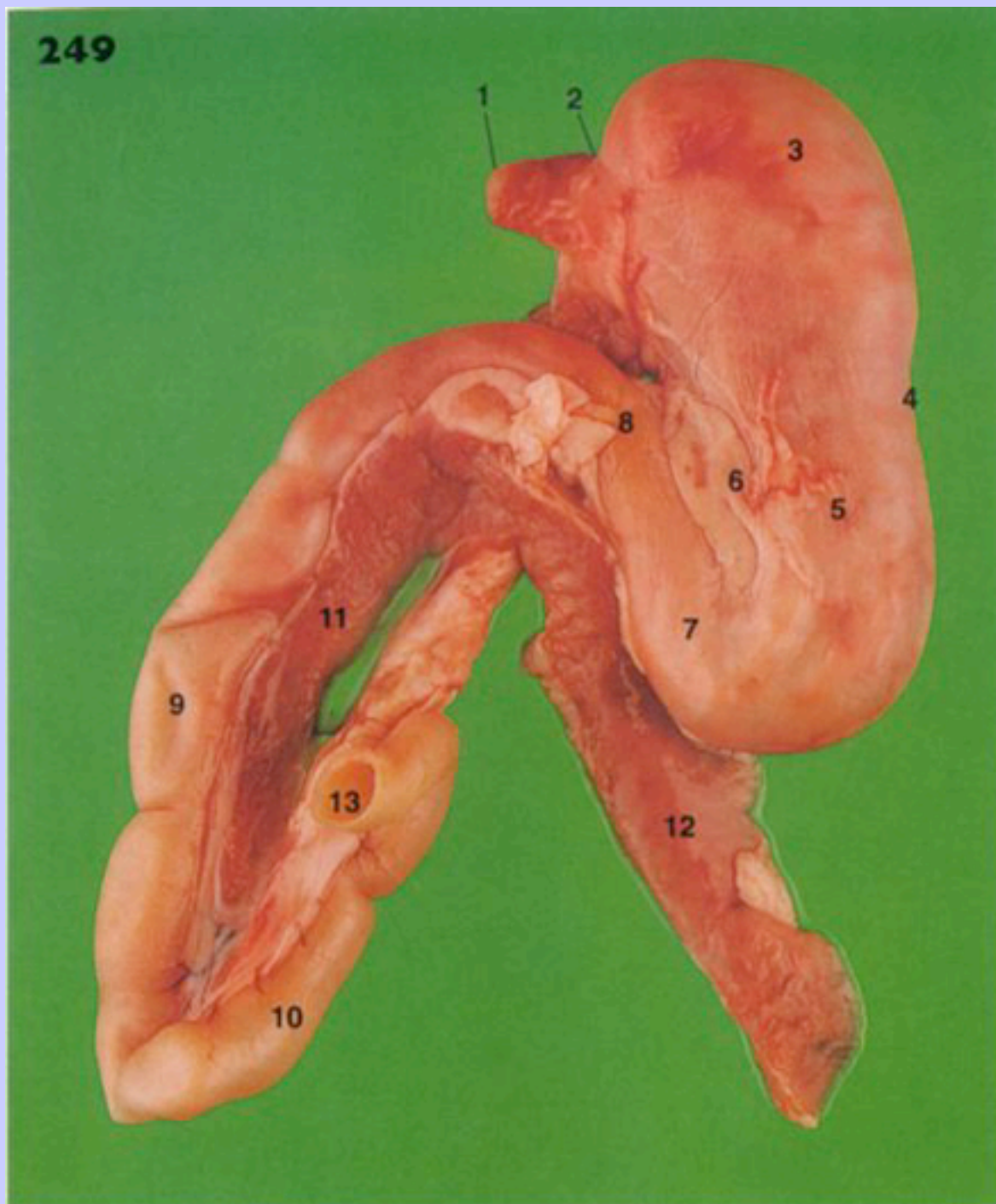
248 Opened stomach of a dog. The organ has been cut along its greater curvature to reveal the mucosal lining. The probe occupies the point of entry of the major duodenal papilla.



- 1 Cardia
- 2 Region of cardiac glands
- 3 Gastric folds
- 4 Region of gastric glands (proper)
- 5 Fundus
- 6 Body
- 7 Region of pyloric glands
- 8 Pyloric antrum
- 9 Pyloric canal
- 10 Pylorus
- 11 Duodenum
- 12 Major duodenal papilla (with probe)
- 13 Minor duodenal papilla
- 14 Pancreatic duct
- 15 Pancreatic tissue

149

249 Stomach, duodenum and pancreas of a cat.



- | | |
|---------------------|-----------------------|
| 1 Oesophagus | 8 Pylorus |
| 2 Cardia | 9 Descending duodenum |
| 3 Fundus | 10 Ascending duodenum |
| 4 Greater curvature | 11 Right lobe |
| 5 Body | 12 Left lobe |
| 6 Lesser curvature | 13 Jejunum |
| 7 Pyloric antrum | |
- of stomach
- of pancreas

250 Ileocolic orifice of a dog. The ileum and the ascending colon have been opened to reveal the change in the nature of the mucosal lining.



- 1 Ileum
- 2 Caecum
- 3 Caecal fold
- 4 Ileocolic orifice and sphincter
- 5 Accessory ileocaecal fold
- 6 Caecocolic orifice
- 7 Ascending colon
- 8 Lymph follicles

150

251 Intestinal tract of a cat. The viscera have been removed from the abdomen and arranged to display the ileocolic junction and the simple, uncoiled blind sac of the caecum of a cat.

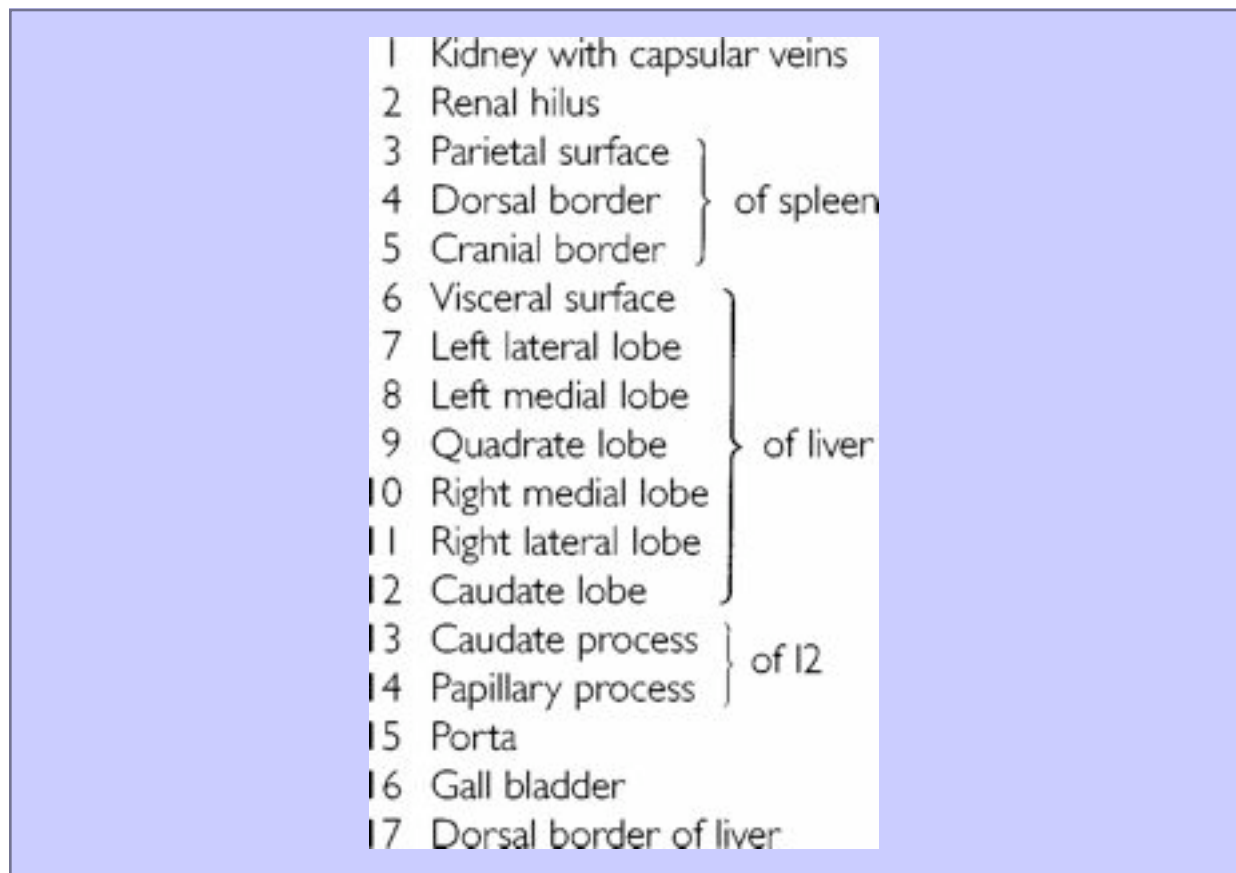
151



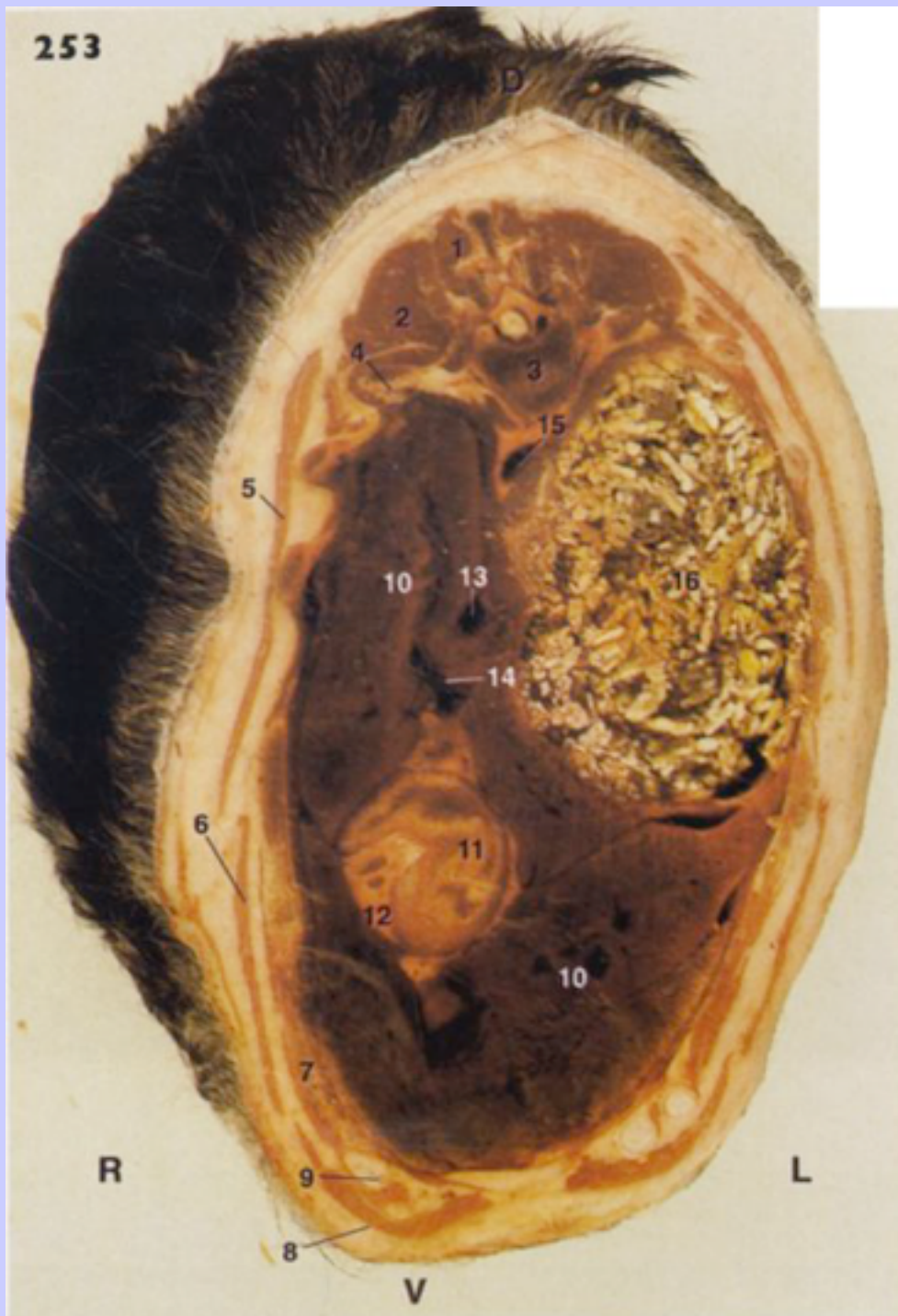
- 1 Coils of jejunum
- 2 Great mesentery
- 3 Mesenteric lymph nodes
- 4 Mesenteric arteries and veins
- 5 Ileum
- 6 Caecum
- 7 Ascending colon
- 8 Transverse colon
- 9 Descending colon

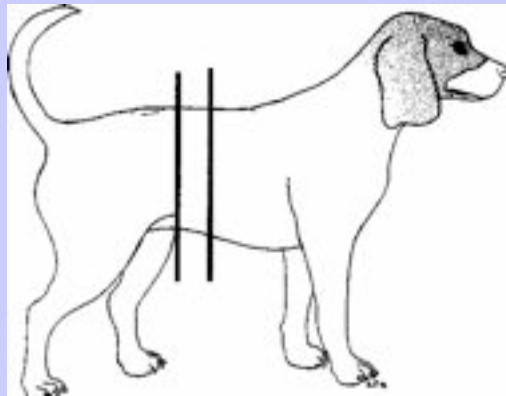
252 Kidney, spleen and liver of a cat.





253 Cranial aspect of a transverse section through the abdomen of a dog, at the level of the eleventh thoracic vertebra. Dorsal (D), ventral (V), left (L) and right (R) orientations are indicated.

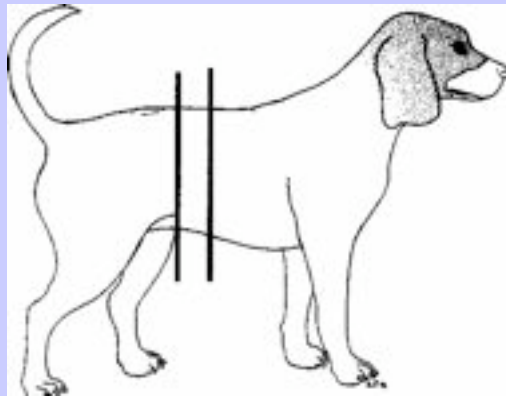




- 1 Mm. multifidus thoracis and lumborum
- 2 Mm. longissimus thoracis and lumborum
- 3 Eleventh thoracic vertebra
- 4 Rib
- 5 M. latissimus dorsi
- 6 M. obliquus externus abdominis
- 7 M. intercostalis
- 8 M. rectus abdominis
- 9 Costal cartilages
- 10 Liver
- 11 Pylorus
- 12 Pancreas
- 13 Caudal vena cava
- 14 Portal vein
- 15 Aorta
- 16 Body of stomach (with contents)

254 Cranial face of a transverse section through the abdominal region of a dog, at the level of the first and second lumbar vertebrae. Left (L) and right (R) orientations are indicated.





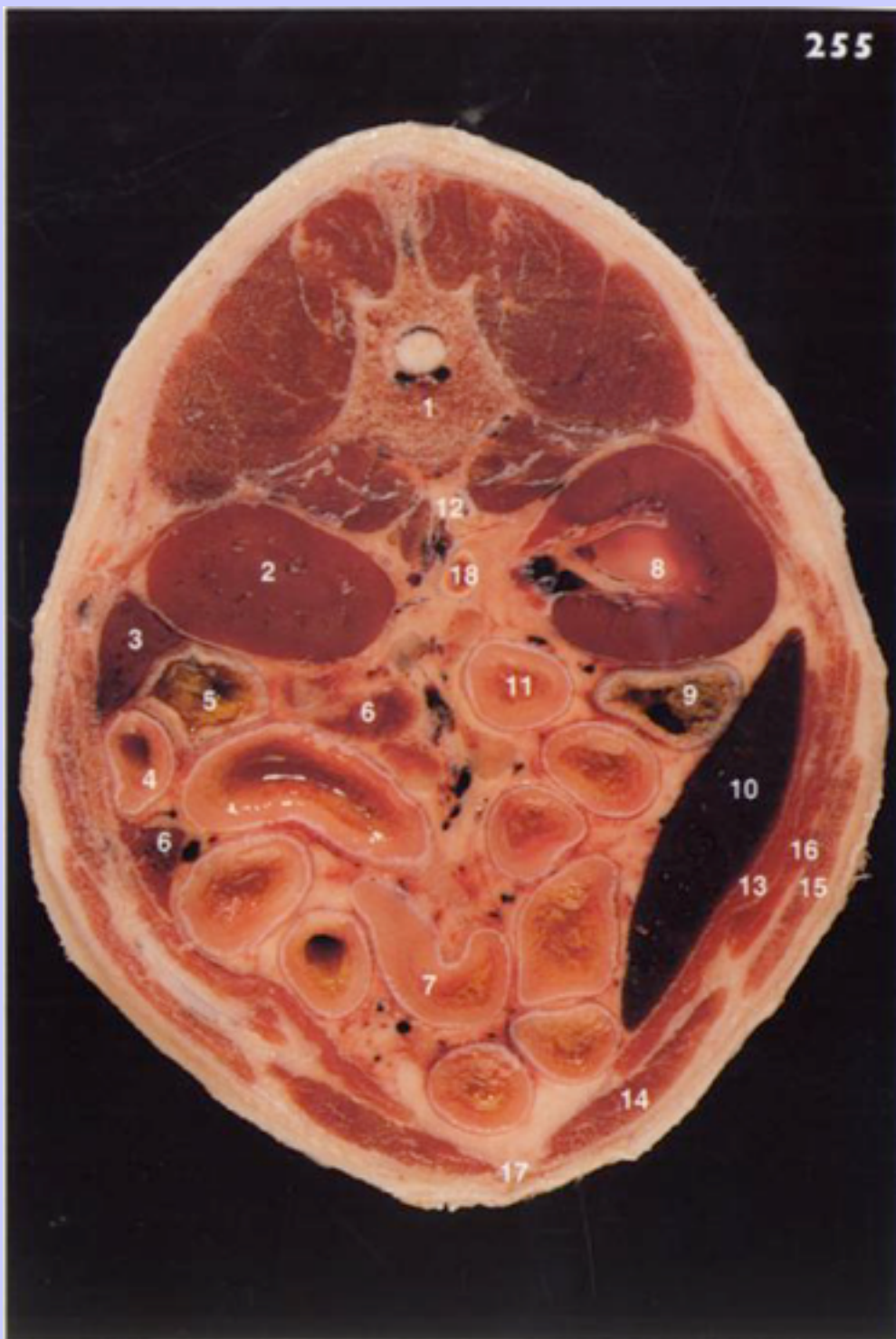
- 1 Mm. multifidus thoracis and lumborum
- 2 Second lumbar vertebra
- 3 First lumbar vertebra
- 4 Intervertebral disc
- 5 M. psoas major
- 6 Mm. longissimus thoracis and lumborum
- 7 M. latissimus dorsi
- 8 M. iliocostalis
- 9 Thirteenth (floating) rib
- 10 M. serratus dorsalis
- 11 M. intercostalis
- 12 Twelfth rib and costochondral junction
- 13 M. obliquus externus abdominis
- 14 M. obliquus internus abdominis
- 15 M. transversus abdominis
- 16 M. rectus abdominis
- 17 Eleventh costal cartilage
- 18 Linea alba

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- 19 Greater omentum
- 20 Jejunum
- 21 Descending duodenum
- 22 Pancreas
- 23 Transverse colon
- 24 Caudate lobe of liver
- 25 Right kidney
- 26 Renal hilus
- 27 Mesenteric lymph nodes
- 28 Root of mesentery
- 29 Caudal vena cava
- 30 Aorta
- 31 Cranial mesenteric vein
- 32 Lumbar lymph nodes
- 33 Dorsal extremity of spleen
- 34 Cranial pole of left kidney
- 35 Gastrosplenic ligament
- 36 Splenic vessels
- 37 Pancreas
- 38 Caudal extremity of spleen
- 39 Descending colon

152

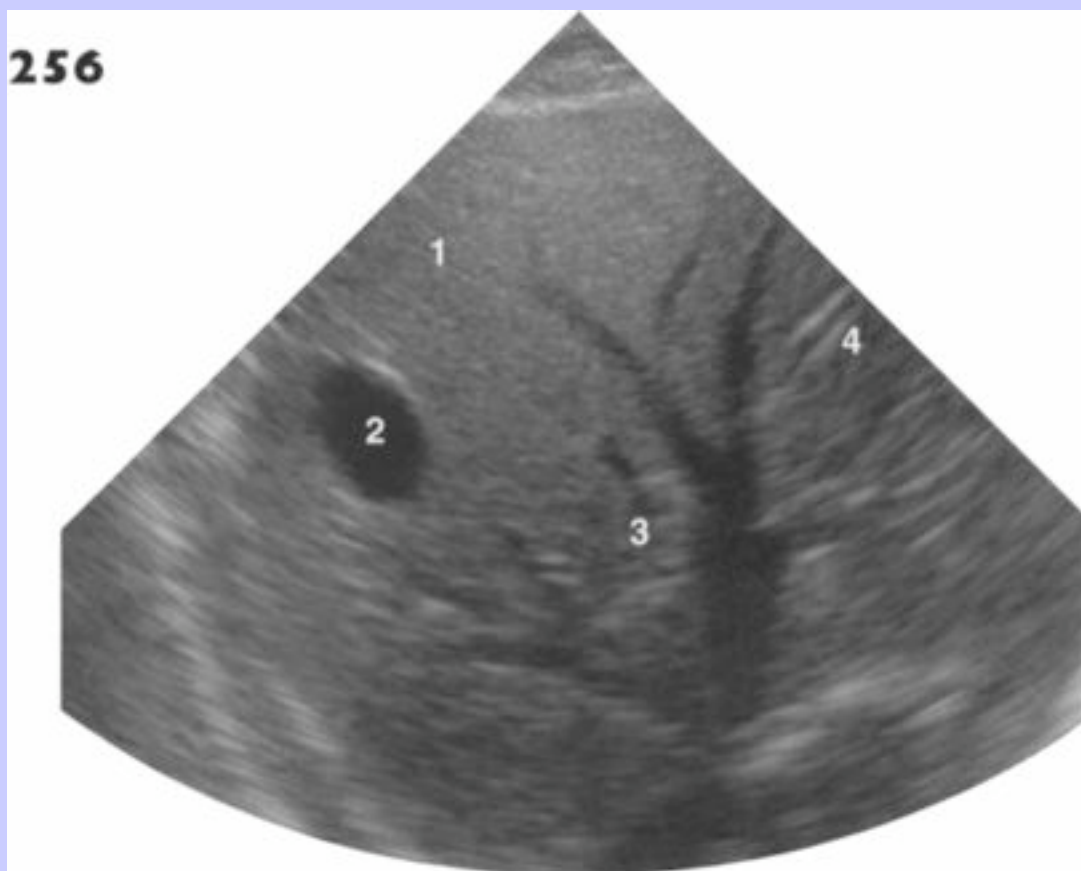
255 Cranial aspect of a transverse section through the abdomen of a dog at the level of the second lumbar vertebra.



- 1 Second lumbar vertebra
- 2 Right kidney
- 3 Caudate lobe of liver
- 4 Descending duodenum
- 5 Ascending colon
- 6 Pancreas
- 7 Jejunum
- 8 Left kidney
- 9 Descending colon
- 10 Spleen
- 11 Ascending duodenum
- 12 Root of mesentery
- 13 M. transversus abdominis
- 14 M. rectus abdominis
- 15 M. obliquus abdominis externus
- 16 M. obliquus abdominis internus
- 17 Linea alba
- 18 Adrenal gland

153

256 Transverse ultrasound scan of the liver of a dog. The gall bladder is seen as a black circular image.

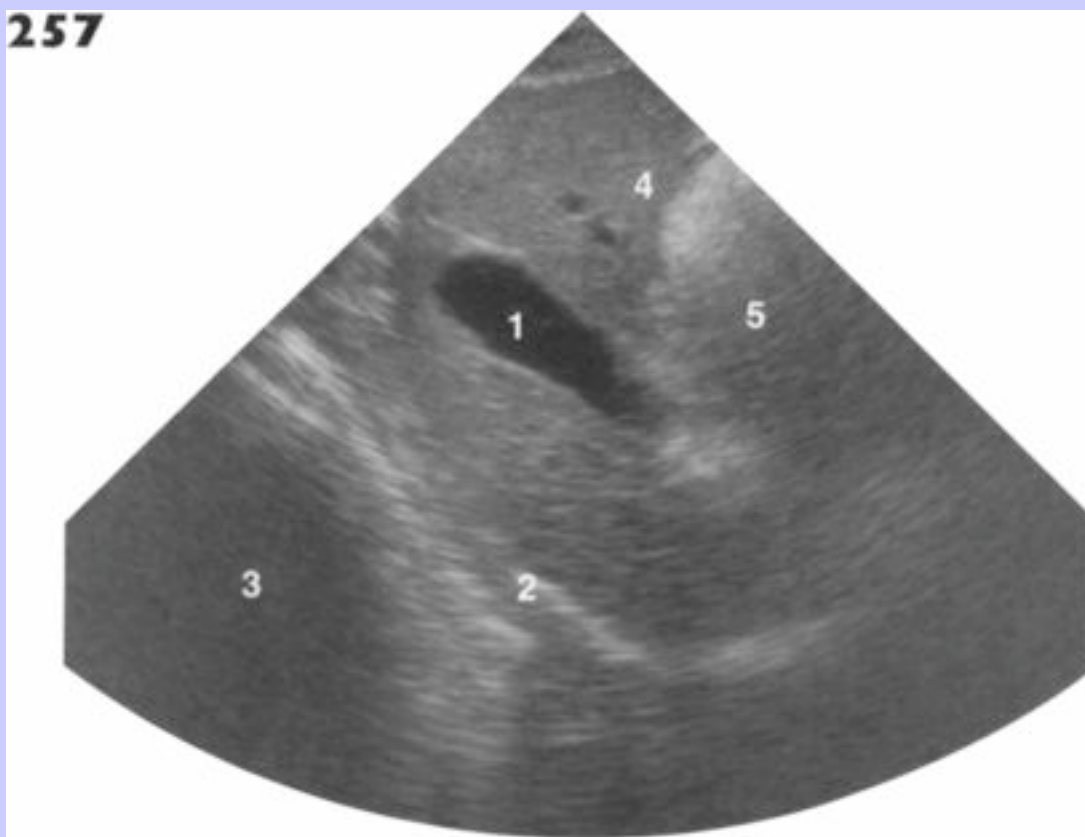


- 1 Liver
- 2 Gall bladder
- 3 Hepatic veins
- 4 Portal veins

6.0.7 Clinical Note

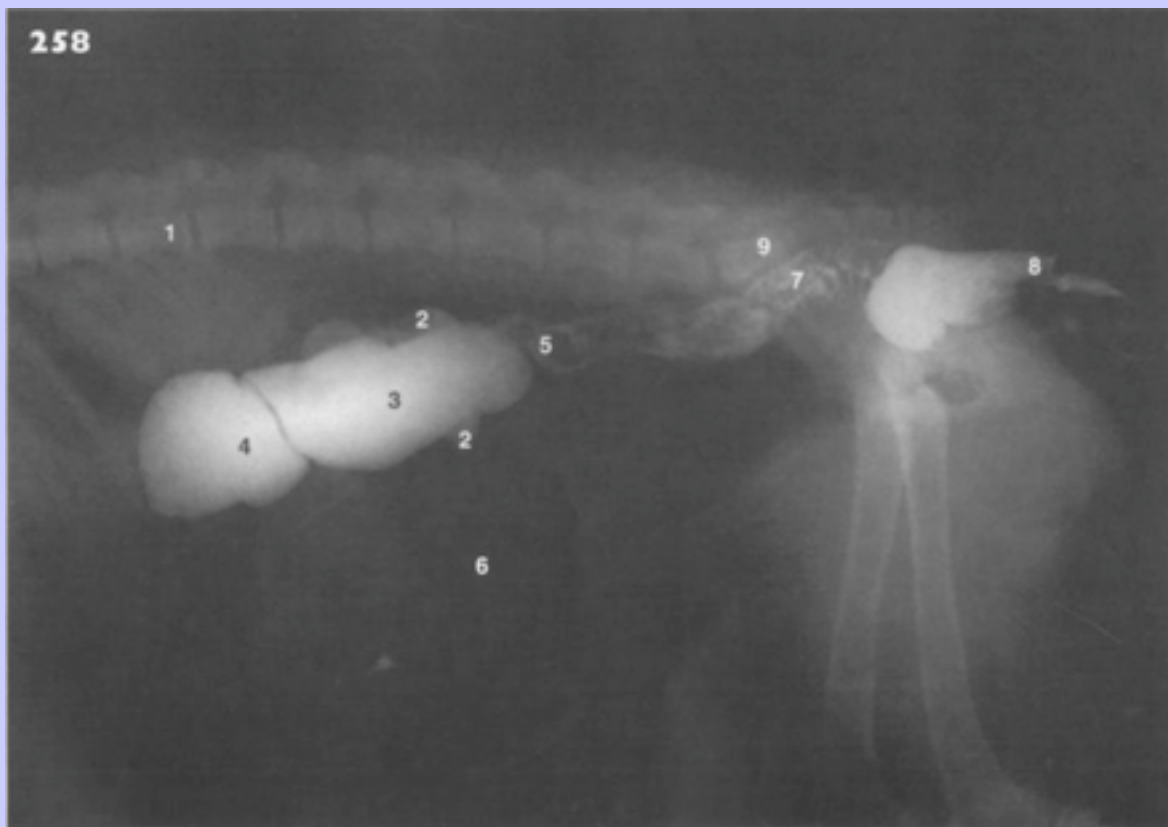
4 Portal veins have walls that give strong echoes, and appear as black structures with bright walls.

257 Longitudinal ultrasound scan of the liver of a dog. The heart can be seen through the diaphragm at depth.



- 1 Gall bladder
- 2 Diaphragm
- 3 Heart
- 4 Hepatic vein
- 5 Stomach

258 Lateral radiograph of the abdomen of a dog. A barium enema has been administered to demonstrate the location of the large intestine.



- 1 First lumbar vertebra
- 2 Caecum
- 3 Ascending colon
- 4 Transverse colon
- 5 Descending colon
- 6 Jejunum
- 7 Rectum
- 8 Anus
- 9 Sacrum

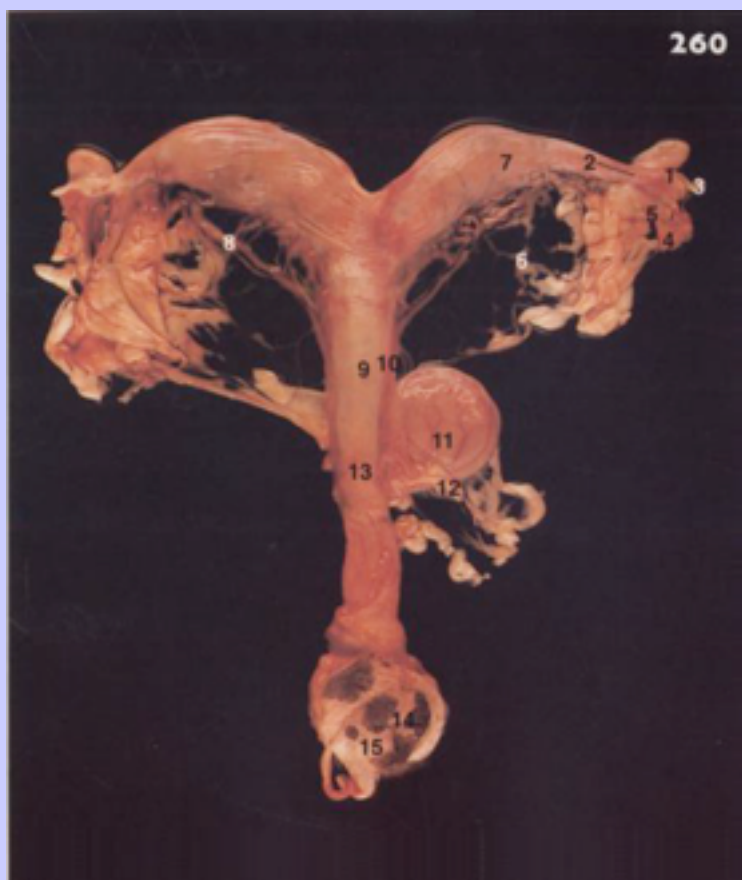
154

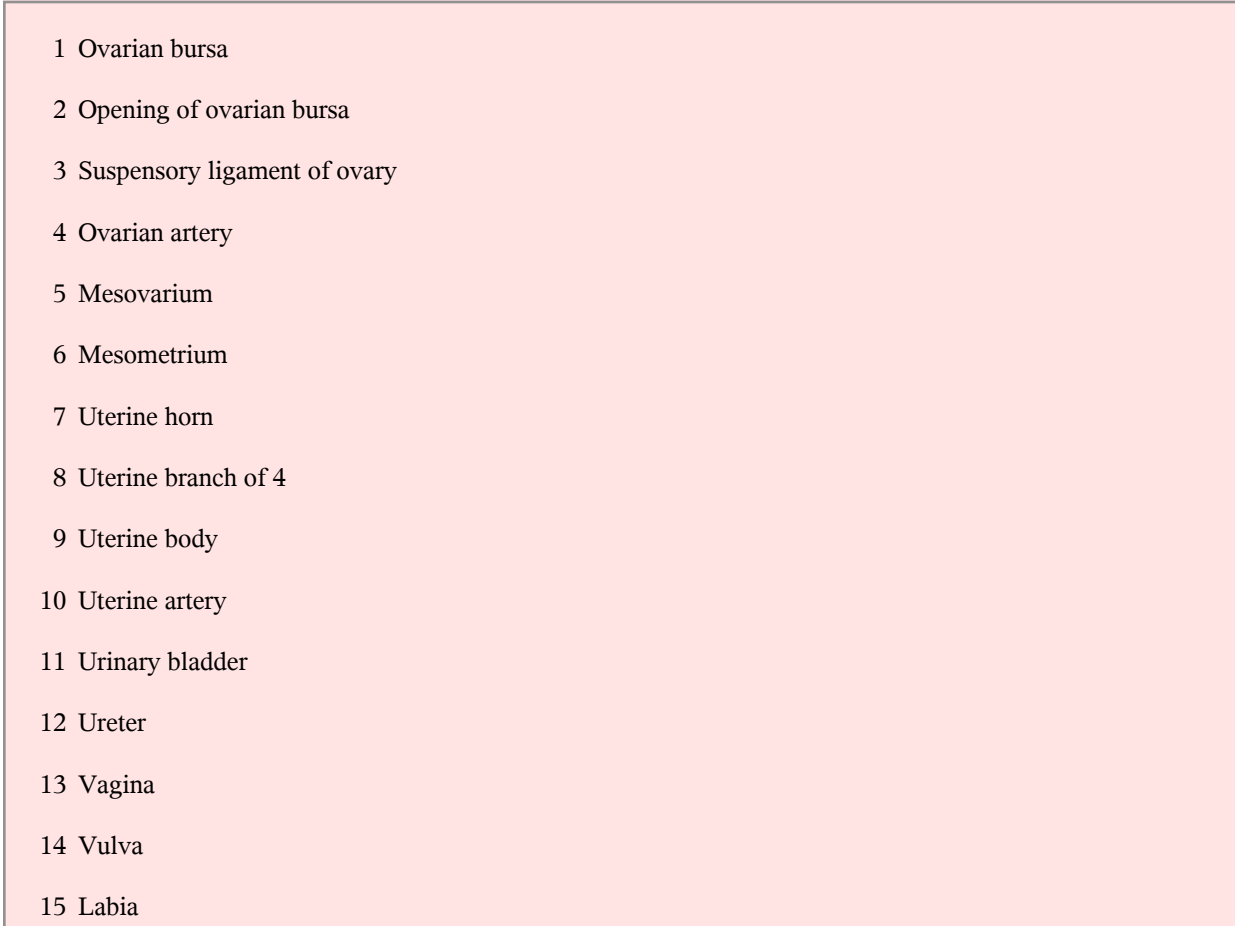
259 Ventrodorsal radiograph of the abdomen of a dog. A barium enema has been administered to demonstrate the location of the large intestine.



- 1 Thirteenth thoracic vertebra
- 2 Caecum
- 3 Ascending colon
- 4 Transverse colon
- 5 Descending colon
- 6 Rectum
- 7 Anus
- 8 Jejunum
- 9 Seventh lumbar vertebra
- 10 Spleen

260 Dorsal aspect of the genital tract of a bitch.



- 
- 1 Ovarian bursa
 - 2 Opening of ovarian bursa
 - 3 Suspensory ligament of ovary
 - 4 Ovarian artery
 - 5 Mesovarium
 - 6 Mesometrium
 - 7 Uterine horn
 - 8 Uterine branch of 4
 - 9 Uterine body
 - 10 Uterine artery
 - 11 Urinary bladder
 - 12 Ureter
 - 13 Vagina
 - 14 Vulva
 - 15 Labia

155

261 Median section through the caudal abdominal and pelvic cavities of a bitch, showing the left side of the region and the topography of the pelvic contents.

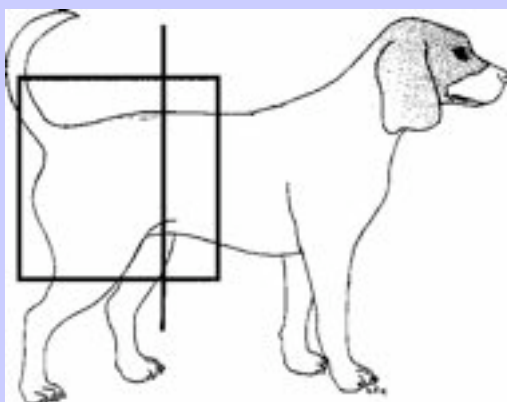


- 1 Sacrum
- 2 Seventh lumbar vertebra
- 3 Descending colon
- 4 Caudal vena cava

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- 5 Rectum
- 6 Jejunum
- 7 Duodenum
- 8 Uterine horn
- 9 Uterine body
- 10 Cervix
- 11 Urinary bladder
- 12 Vagina
- 13 Vestibule
- 14 Vulva
- 15 Pubis
- 16 M. obturatorius internus
- 17 M. adductor
- 18 M. rectus abdominis
- 19 External pudendal artery and vein
- 20 Superficial inguinal lymph node
- 21 Inguinal mammary gland
- 22 Teat
- 23 Caudal superficial epigastric artery and vein

262 Cranial aspect of a transverse section of the trunk of a bitch, at the level of the seventh lumbar vertebra.



- 1 Wing of ilium
- 2 Seventh lumbar vertebra
- 3 M. iliopsoas
- 4 Internal iliac artery and vein

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- 5 Rectum
- 6 Uterine body
- 7 Urinary bladder
- 8 M. rectus abdominis
- 9 Mammary gland
- 10 Femur

156

157

263 Dorsal aspect of the uterus of a pregnant bitch.



- | | | | | |
|----|---------------------------------|------|----|--|
| 1 | Suspensory ligament | } of | 11 | Uterine body |
| 2 | Proper ligament | | 12 | Vagina |
| 3 | Mesovarium | | 13 | Urinary bladder |
| 4 | Opening of ovarian bursa | | 14 | Vestibule |
| 5 | Mesometrium (broad
ligament) | | 15 | Vulva |
| 6 | Round ligament | | 16 | Uterine branch of ovarian
artery and vein |
| 7 | Uterine horn | | 17 | Ovarian bursa (opened) |
| 8 | Loci of conceptuses | | 18 | Ovary bearing corpora lutea |
| 9 | Area of zonary band | | 19 | Infundibulum |
| 10 | Uterine artery and vein | | 20 | Oviduct |

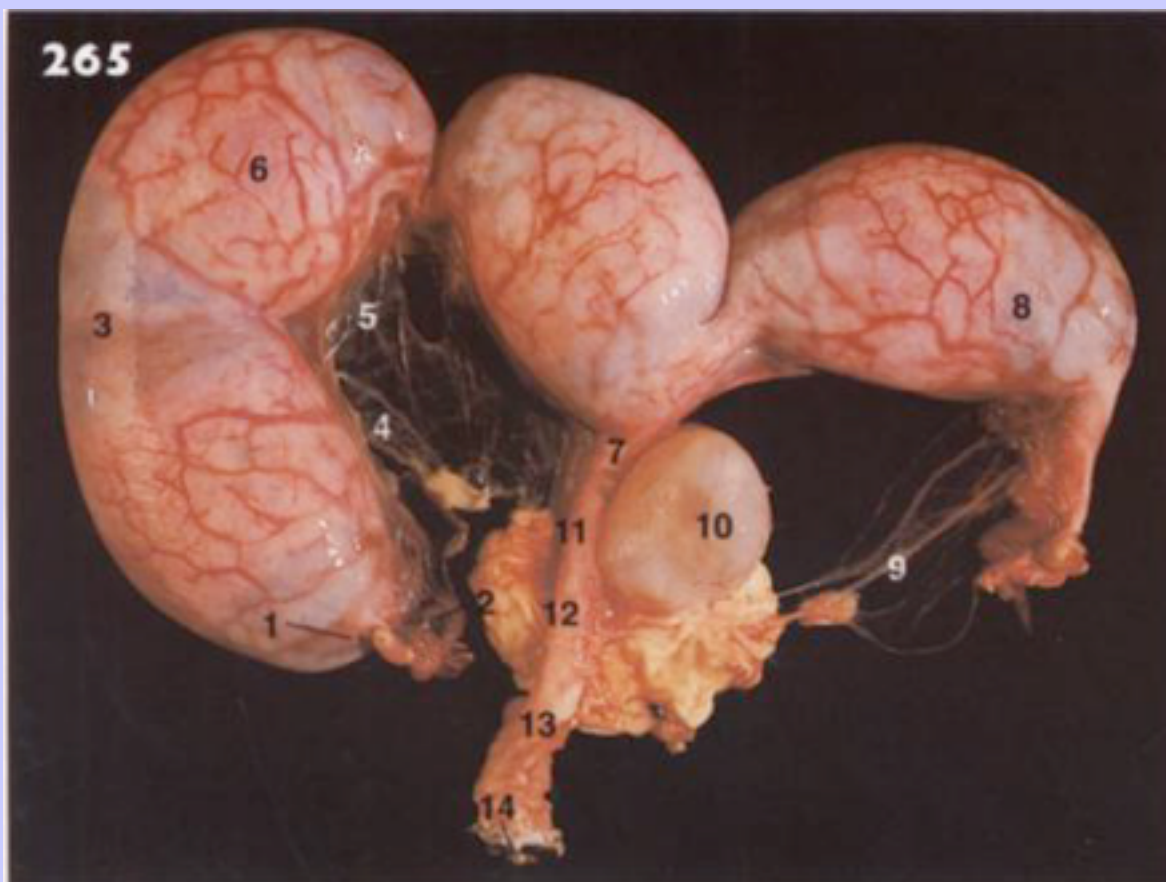
264 Dorsal aspect of the genital tract of a bitch. The tract, which has been opened dorsally, illustrates an endometrial lining that is typical of a postparturient bitch.



- 1 Ovary extruded from bursa
- 2 Uterine tube
- 3 Uterine horn
- 4 Endometrium
- 5 Area of detached placentation (zonary)
- 6 Uterine branch of ovarian artery and vein
- 7 Uterine body
- 8 Mesometrium (broad ligament)
- 9 Cervix
- 10 External uterine orifice
- 11 Vagina
- 12 Urinary bladder
- 13 Mucosal folds
- 14 External urethral orifice
- 15 Vestibule
- 16 Vestibule bulb
- 17 M. constrictor vestibuli
- 18 Clitoris
- 19 Fossa clitoridis
- 20 Labia

157

265 Dorsal aspect of the uterus of a pregnant cat, showing the location of four conceptuses.

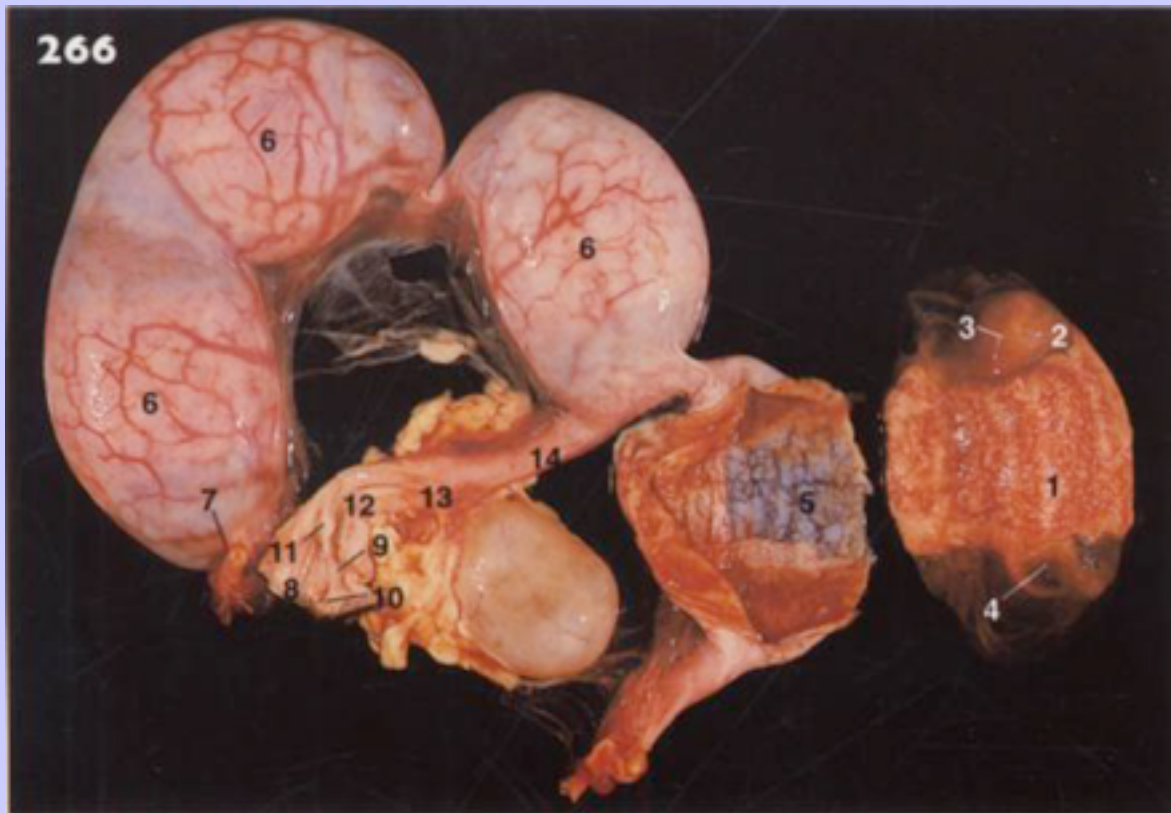


- 1 Ovary with corpora lutea
- 2 Mesovarium with ovarian artery and vein
- 3 Gravid left uterine horn
- 4 Mesometrium
- 5 Uterine branch of ovarian artery
- 6 Placental bands seen through myometrium
- 7 Uterine body
- 8 Right uterine horn
- 9 Round ligament

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- 10 Urinary bladder
- 11 Level of cervix
- 12 Vagina
- 13 Vestibule
- 14 Vulva

266 Dorsal aspect of the uterus of a pregnant cat. The loculus of the right horn has been opened and the foetus, surrounded by the foetal membranes and zonary placenta, has been displaced. The vulva, vestibule and vagina have been opened dorsally.

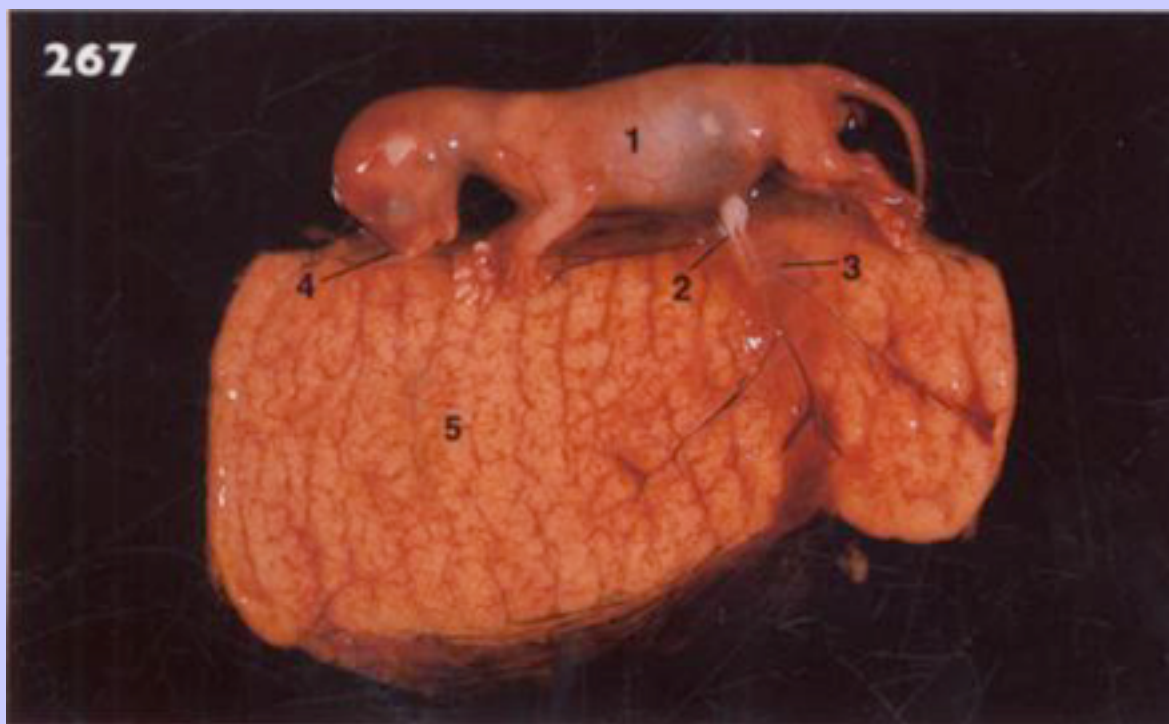


- 1 Zonary placental band surrounding foetus
- 2 Foetus within foetal membranes
- 3 Cranium

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- 4 Tall and pelvic limb of foetus
- 5 Myometrium (stripped of endometrium)
- 6 Intact loculi
- 7 Ovary with corpora lutea
- 8 Vulva
- 9 Vestibule
- 10 Fossa clitoridis enclosing clitoris
- 11 External urethral orifice
- 12 Vagina
- 13 Cervix
- 14 Uterine body

267 Feline foetus with opened foetal membranes and sectioned placental band.



- 1 Foetus

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- 2 Umbilicus
- 3 Umbilical vessels
- 4 Opened foetal membranes
- 5 Placental band

158

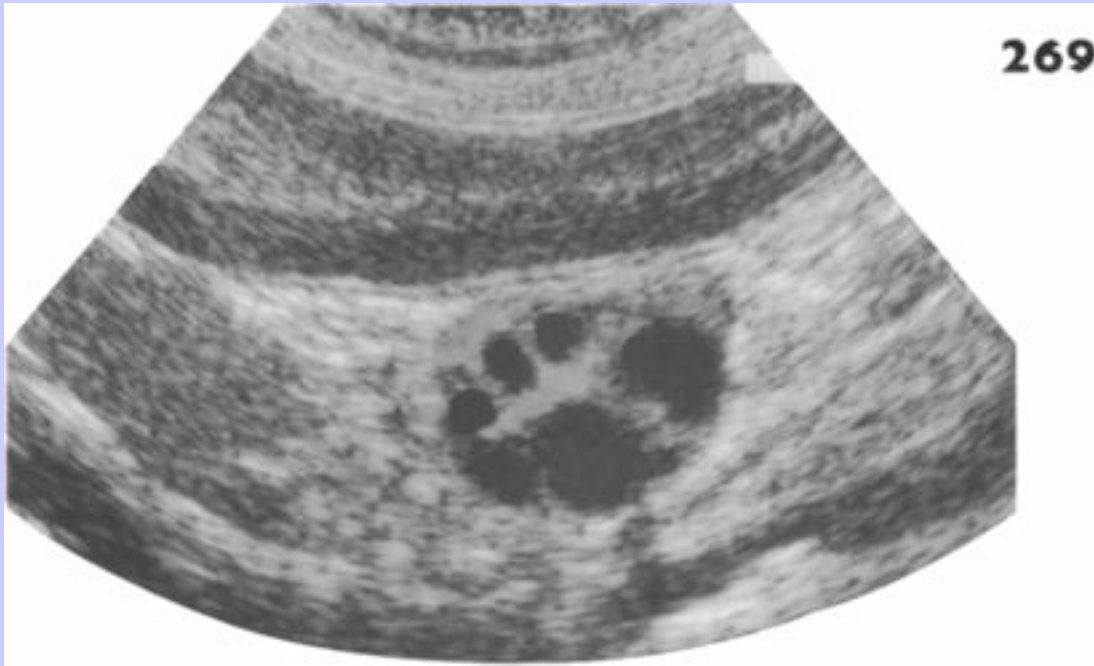
268 Lateral radiograph of the abdomen of a pregnant cat.

159

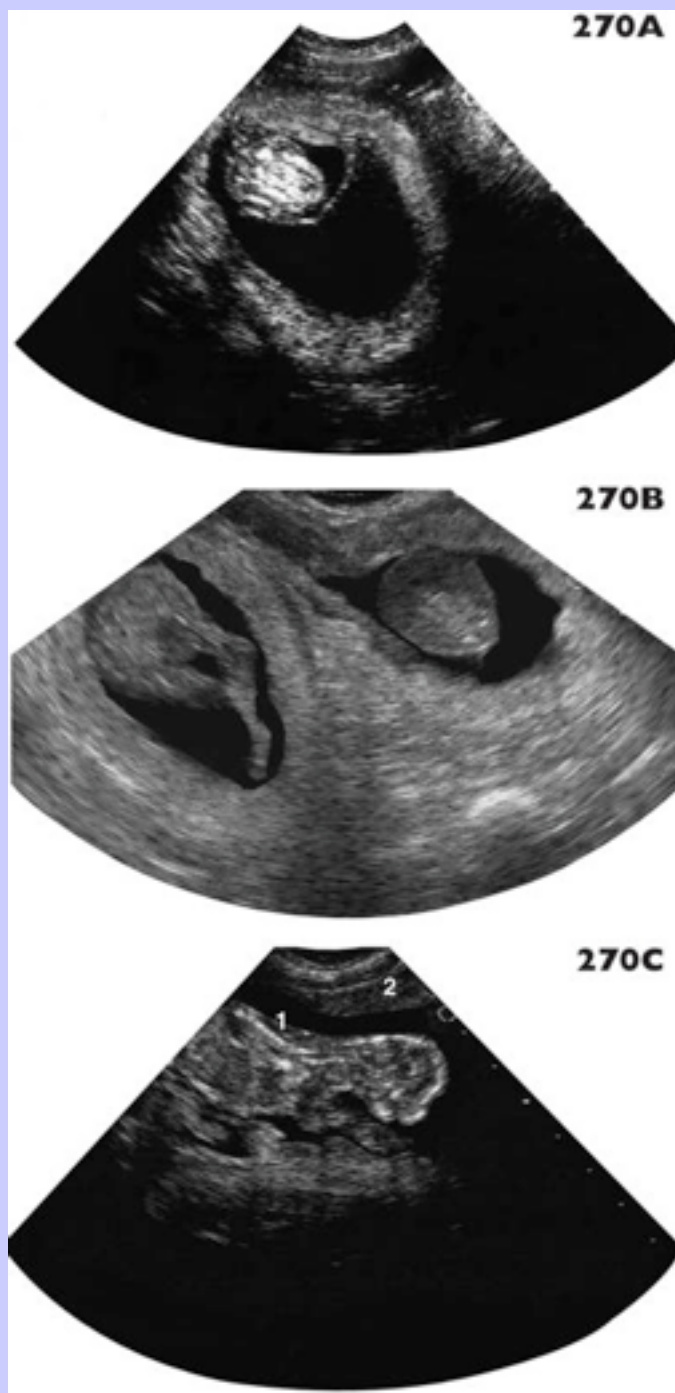


- 1 Foetal skulls
- 2 Foetal vertebrae
- 3 Foetal limbs
- 4 Foetal ribs
- 5 Pelvic inlet

269 Ultrasound scan of the ovary of a bitch, made through the lateral abdominal wall. The muscle layers can be seen at the top of the scan and the ovary occupies the centre of the field. The darkened circular areas on the ovarian surface are follicles.



270 Ultrasound scans of the uteri of three pregnant bitches, through the ventral abdominal wall.



A Early pregnancy, showing the conceptus surrounded by the placental membranes. The lumen of the uterus appears black (anechoic).

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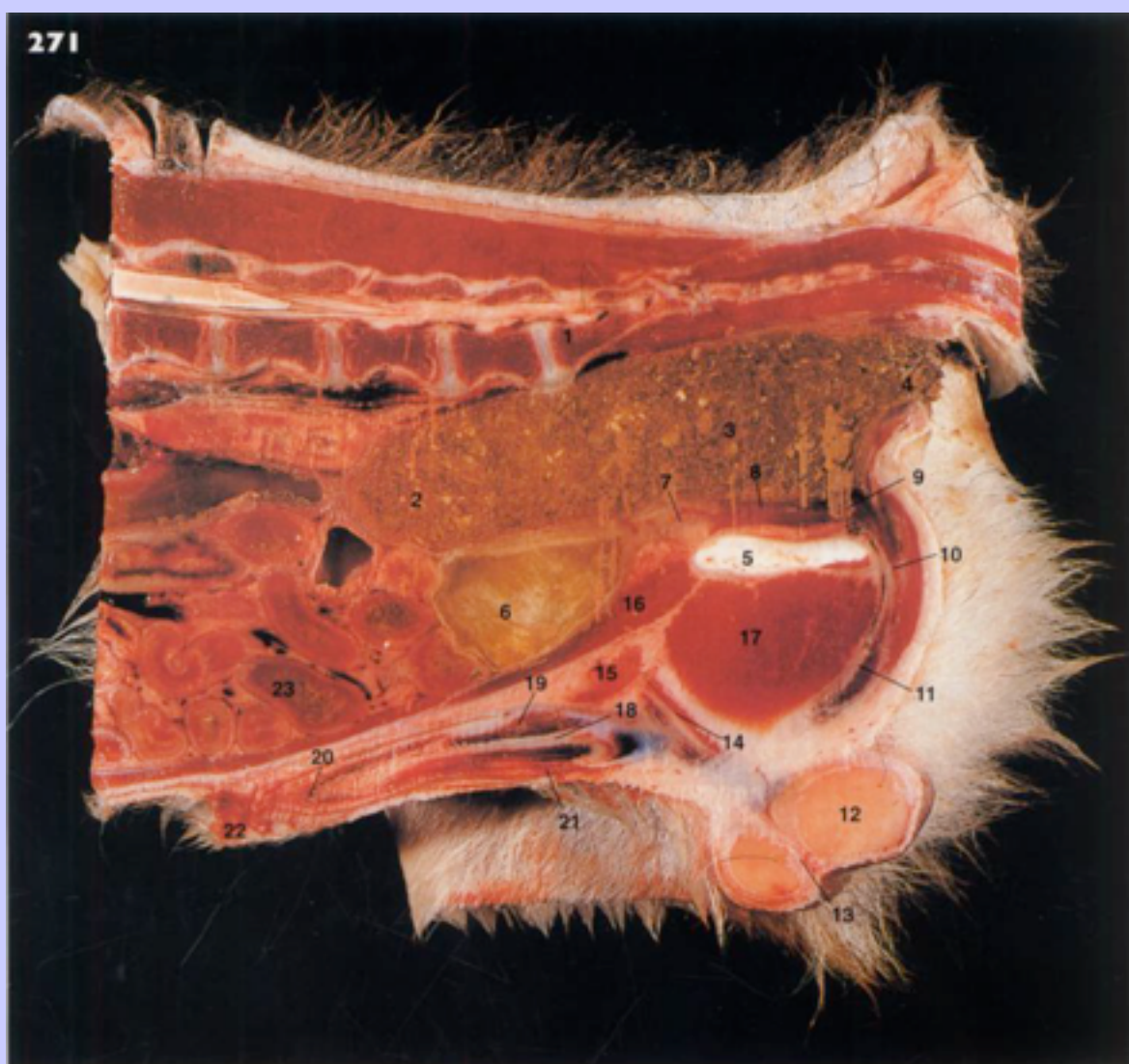
B Twin pregnancy showing conceptuses lying within the lumen of the uterine horns. The foetuses are enlarged in cross section.

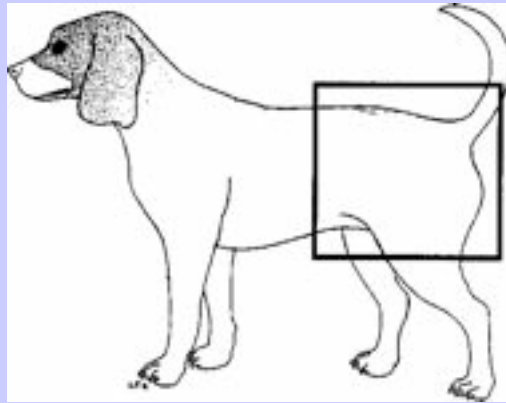
C Scan of the thoracic region of a foetus in late pregnancy. The foetal ribs are evident as strong, white echoes lying in the centre of the field and extending to the left (1). The placental band can be seen peripheral to this (2).

159

160

271 Paramedian section of the caudal abdominal and pelvic cavities of a male dog, showing the topography of the pelvic contents and the external genitalia.





- 1 Sacrum
- 2 Descending colon
- 3 Rectum
- 4 Anus
- 5 Pubis
- 6 Urinary bladder
- 7 Prostate
- 8 Pelvic urethra
- 9 Penile urethra
- 10 M. ischiocavernosus
- 11 Corpus cavernosum penis
- 12 Testis
- 13 Scrotum
- 14 Spermatic cord
- 15 Superficial inguinal lymph node
- 16 M. rectus abdominis
- 17 M. adductor
- 18 Os penis

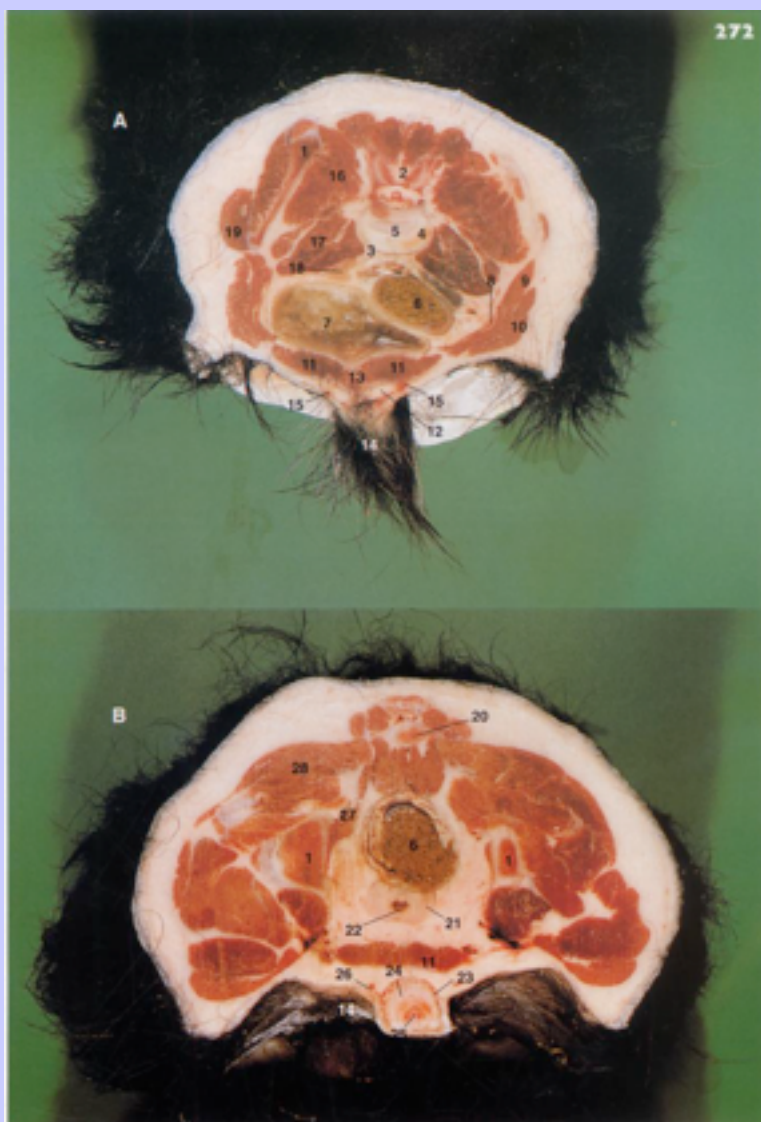
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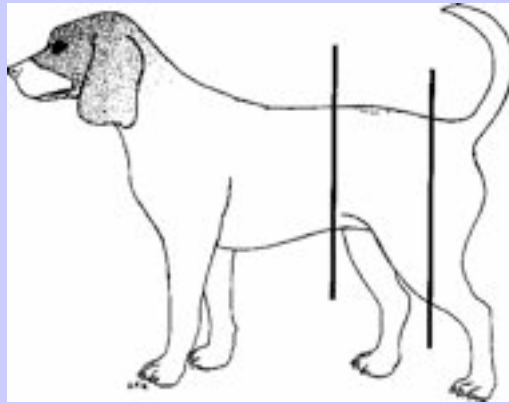
- 19 Bulbus glandis
- 20 Pars longa glandis
- 21 Penile urethra in ventral groove
- 22 Prepuce
- 23 Jejunum

160

161

272 Cranial aspect of transverse sections through the seventh lumbar (A) and first caudal (B) vertebrae of a male dog, showing the topography of the pelvic contents.





- 1 Ilium
- 2 Seventh lumbar vertebra
- 3 Intervertebral disc
- 4 Annulus fibrosus
- 5 Nucleus pulposus
- 6 Rectum
- 7 Urinary bladder
- 8 M. transversus abdominis
- 9 M. obliquus internus abdominis
- 10 M. obliquus externus abdominis
- 11 M. rectus abdominis
- 12 M. protractor preputii
- 13 Linea alba
- 14 Prepuce
- 15 Preputial branches of external pudendal artery
- 16 Mm. iliocostalis and longissimus lumborum
- 17 Mm. iliacus and psoas major
- 18 Hypogastric lymph node

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- 19 M. tensor fasciae latae
- 20 First caudal vertebra
- 21 Prostate gland
- 22 Pelvic urethra
- 23 Bulbus glandis of penis
- 24 Os penis
- 25 Penile urethra
- 26 Superficial branch of dorsal artery of penis
- 27 M. coccygeus
- 28 Gluteal muscle mass

161

273 Cranial aspect of a transverse section through the pelvic region of a dog at the level of the third caudal vertebra.



- 1 Third caudal vertebra
- 2 M. gluteus superficialis
- 3 M. gluteus medius
- 4 M. gluteus profundus
- 5 Acetabulum
- 6 Femoral head
- 7 Articular surface of 6
- 8 Ligament of the head of the femur (Teres ligament, round ligament)
- 9 Femoral neck
- 10 Greater trochanter
- 11 Lesser trochanter
- 12 Trochanteric fossa
- 13 Body of ilium
- 14 Pelvic symphysis
- 15 Pubis
- 16 M. obturator externus
- 17 M. quadratus femoris
- 18 M. pubocaudalis
- 19 Rectum
- 20 Pelvic urethra
- 21 M. levator ani
- 22 M. adductor
- 23 M. biceps femoris
- 24 M. semitendinosus
- 25 M. semimembranosus
- 26 M. gracilis

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- 27 Penis
- 28 Spermatic cord
- 29 Testis
- 30 Scrotum

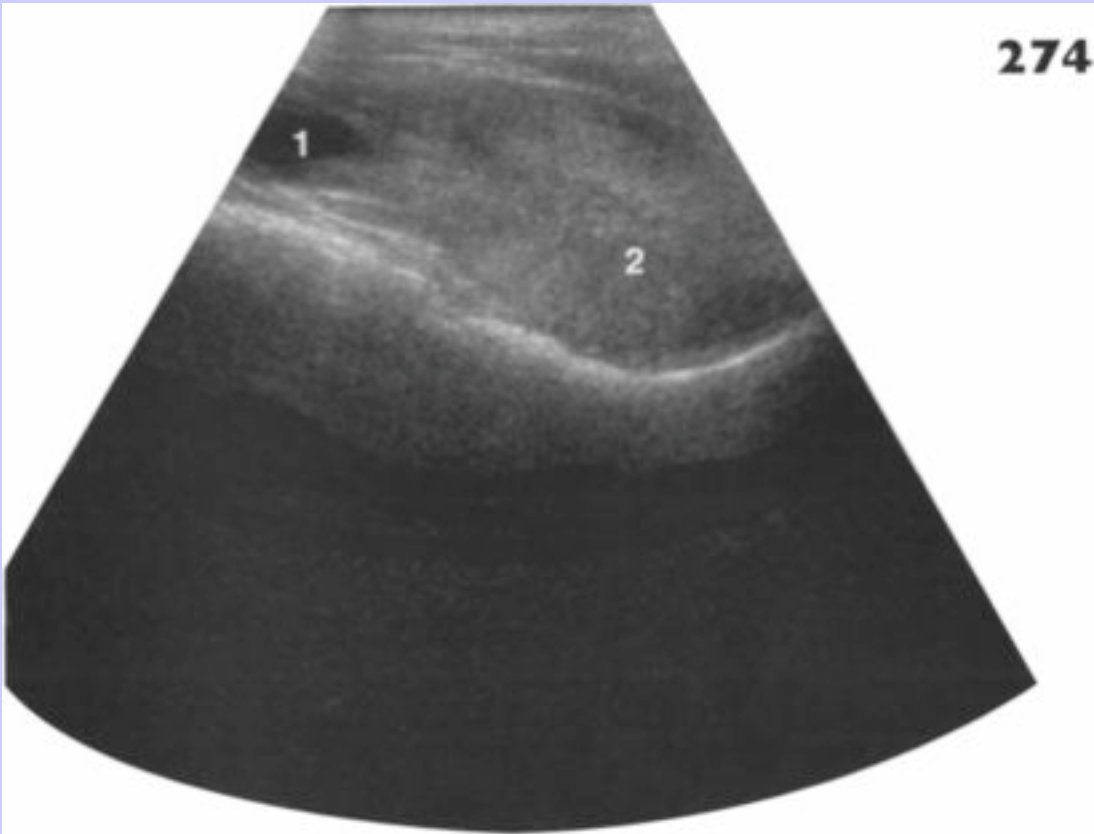
6.0.8 Clinical Note

21 This muscle in combination with the coccygeus muscle form the structure of the pelvic diaphragm which lies to either side of the rectum offering lateral support during the contractions of defaecation. In older dogs, particularly males, this support may degenerate as these muscles atrophy. This causes the rectum to deviate to the side of breakdown during attempted defaecation with a resulting swelling developing subcutaneously, lateral to the anus in the perineal region. This is the clinical condition referred to as perineal hernia.

162

163

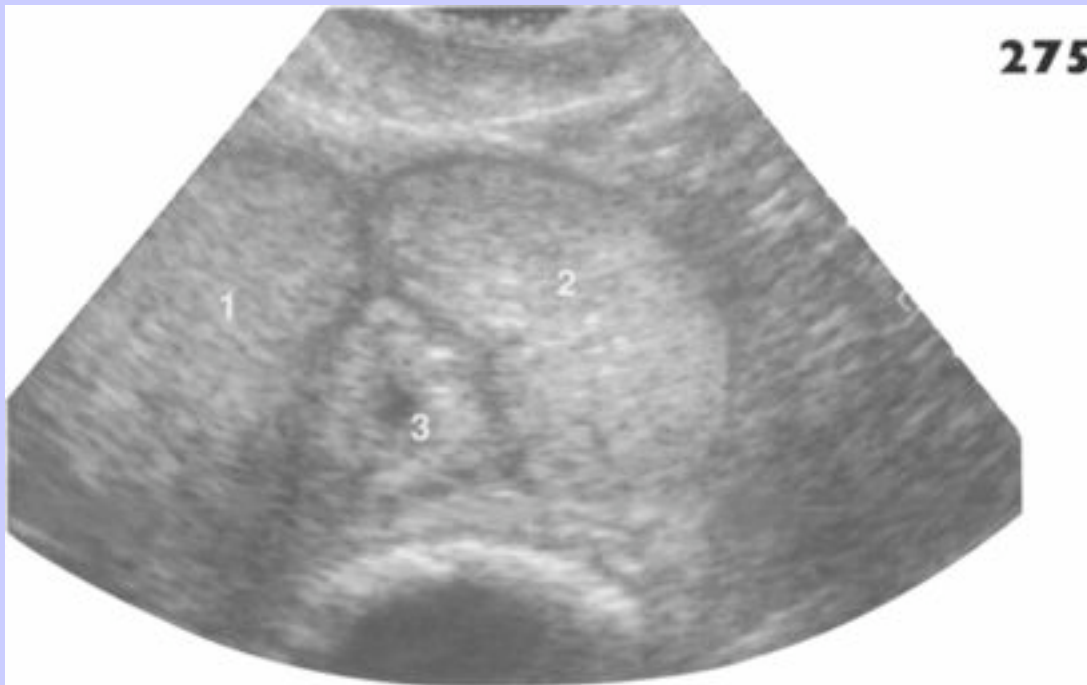
274 Ultrasound scan through the ventral abdominal wall of a male dog, made in the prepubic location. The urinary bladder can be seen with the prostate immediately adjacent to it.



1 Urinary bladder

2 Prostate gland

275 Caudal ultrasound scan through the ventral abdominal wall of a male dog, made in the prepubic location. The bilobed nature of the prostate, which is in cross section, can be seen.



1 Left lobe of prostate

2 Right lobe of prostate

3 Neck of urinary bladder

163

276 Caudal aspect of the perineum of a bitch.

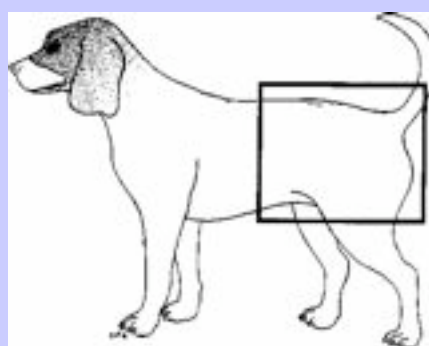
164



- 1 M. sacrocaudalis ventralis lateralis
- 2 M. rectococcygeus
- 3 M. sphincter ani externus
- 4 M. coccygeus
- 5 M. levator ani
- 6 Anus
- 7 Ischiatic tuberosity
- 8 M. obturatorius internus
- 9 M. ischiourethralis
- 10 M. constrictor vestibuli
- 11 M. constrictor vulvae
- 12 Labia
- 13 Vulva
- 14 M. biceps femoris
- 15 M. semitendinosus
- 16 M. semimembranosus
- 17 M. gracilis
- 18 Internal pudendal artery and vein, and pudendal nerve
- 19 Caudal rectal artery and vein
- 20 Perineal artery and vein
- 21 Artery and vein of vestibular bulb

164

277 Caudolateral aspect of the perineum and external genitalia of a bitch.



1 M. gluteus medius

2 M. gluteus superficialis

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- 3 Cranial dorsal iliac spine
- 4 M. sartorius
- 5 M. tensor fascia latae
- 6 Fascia lata
- 7 M. biceps femoris
- 8 M. semitendinosus
- 9 M. semimembranosus
- 10 Ischiatic tuberosity
- 11 Mm. intertransversarii dorsales caudales
- 12 Mm. intertransversarii ventrales caudales
- 13 Sacrotuberous ligament
- 14 M. coccygeus
- 15 M. levator ani
- 16 Anus
- 17 M. sphincter ani externus
- 18 Fibres from first and second caudal spinal nerves
- 19 M. constrictor vulvae
- 20 Vulva

278 Caudal aspect of the perineum and external genitalia of a male dog.



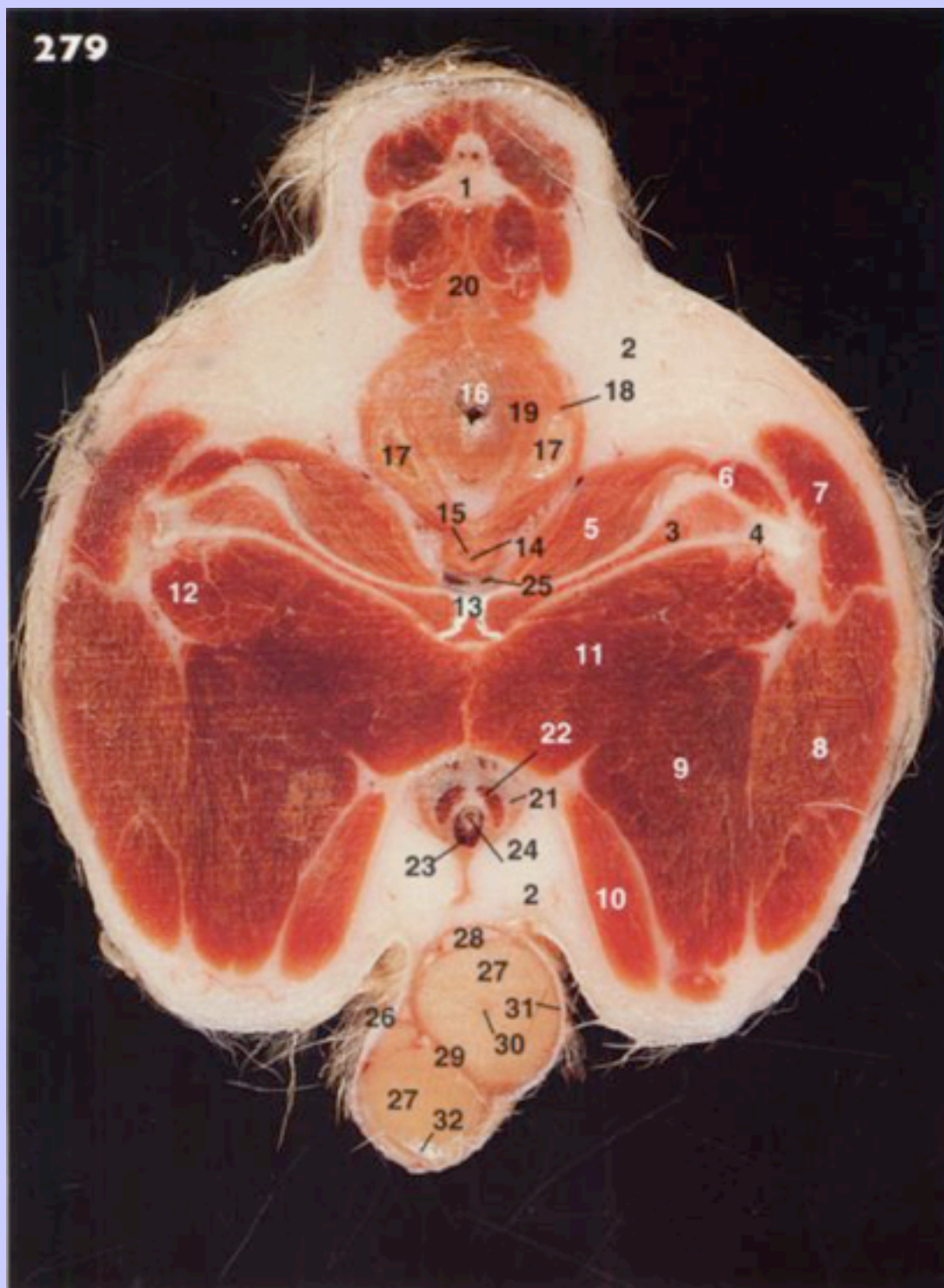
- 1 M. rectococcygeus
- 2 M. sphincter ani externus
- 3 M. coccygeus

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- 4 M. levator ani
- 5 Anus
- 6 Ischiatic tuberosity
- 7 M. obturatorius internus
- 8 Internal pudendal artery and vein, and pudendal nerve
- 9 M. ischiourethralis
- 10 M. ischiocavernosus
- 11 M. bulbospongiosus
- 12 M. retractor penis
- 13 M. biceps femoris
- 14 M. semitendinosus
- 15 M. semimembranosus
- 16 M. gracilis
- 17 M. adductor
- 18 Spermatic cord
- 19 Testis within parietal vaginal tunic
- 20 External spermatic fascia

165

279 Caudal aspect of a transverse section through the perineal region of a dog at the level of the fourth caudal vertebra.



- 1 Fourth caudal vertebra
- 2 Adipose tissue
- 3 Ischium
- 4 Ischiatic tuberosity
- 5 M. gemellus
- 6 M. obturator internus
- 7 M. biceps femoris
- 8 M. semitendinosus
- 9 M. semimembranosus
- 10 M. gracilis
- 11 M. adductor
- 12 M. quadratus femoris
- 13 Pelvic symphysis
- 14 Pelvic urethra
- 15 Pars spongiosum of urethra
- 16 Anal canal
- 17 Anal sacs
- 18 M. sphincter ani externus
- 19 M. sphincter ani internus
- 20 M. rectococcygeus
- 21 Tunica albuginea of penis
- 22 Corpus cavernosus penis
- 23 Corpus spongiosum
- 24 Penile urethra
- 25 Artery of penis
- 26 Scrotum

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- 27 Testes
- 28 Epididymus
- 29 Scrotal septum
- 30 Mediastinum testis
- 31 Vaginal tunic (parietal and visceral)
- 32 Spermatic fascia

6.0.9

Clinical Note

- 17 Note the position of the anal sacs lying between the internal and external sphincter muscles. The sac accumulates secretion from glands within its walls and this travels to the exterior via ducts opening at the periphery of the anal orifice. Blockage of these ducts can cause impaction of these sacs producing discomfort to the dog and even resulting in abscessation in the perineal region. Impaction can be relieved by digital pressure being applied laterally over the sacs resulting in expression of a foul-smelling secretion. The secretion is thought to be a scent-marking device of the dog.

166

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280 Caudolateral aspect of the perineum of a male dog.



- 1 Cranial dorsal iliac spine
- 2 M. gluteus medius
- 3 M. gluteus superficialis
- 4 M. sartorius
- 5 M. tensor fasciae latae
- 6 Greater trochanter
- 7 M. biceps femoris
- 8 M. semitendinosus
- 9 M. semimembranosus
- 10 M. gracilis
- 11 Ischiatic tuberosity
- 12 Sacrotuberous ligament
- 13 Mm. intertransversarii dorsales caudales
- 14 Mm. intertransversarii ventrales caudales
- 15 M. coccygeus
- 16 M. levator ani
- 17 Anus
- 18 M. sphincter ani externus
- 19 Position of anal sac (deep to 18)
- 20 M. rectococcygeus
- 21 Fibres from first and second caudal spinal nerves
- 22 M. retractor penis
- 23 M. bulbospongiosus
- 24 M. ischiocavernosus
- 25 M. ischiourethralis
- 26 Body of penis

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- 27 Corpus spongiosum penis
- 28 M. obturatorius internus
- 29 Internal pudendal artery giving origin to dorsal artery of penis and ventral perineal artery
- 30 Caudal rectal artery
- 31 Pudendal nerve

281 Dorsal (A) and ventral (B) aspect of the os penis of a dog.



- 1 Cranial extremity
- 2 Caudal extremity (proximal)
- 3 Ventral groove

6.0.10 Clinical Note

- 3 Note the ventral groove which encloses the urethra in life. Urethral obstruction commonly occurs at the proximal end of this groove.

167

282 Dorsal aspect of a section made in the dorsal plane through the anus and pelvic cavity of a dog, showing the topography of the rectum and the muscles of the pelvic diaphragm. Orientation cranially (Cr) and caudally (Ca) is indicated.



- 1 Descending colon
- 2 Rectum
- 3 Pelvic inlet
- 4 Ilium
- 5 M. levator ani
- 6 Fat (in ischiorectal fossa)
- 7 Anal sac
- 8 M. sphincter ani externus
- 9 Circumanal glands
- 10 Anal opening
- 11 M. sphincter ani internus
- 12 M. coccygeus
- 13 Sacrotuberous ligament
- 14 Ischiatic nerve
- 15 Caudal gluteal artery and vein
- 16 Gluteal muscle
- 17 Mm. gemelli

6.0.11 Clinical Note

13 & 14 Observe the relative proximity of the ischiatic nerve and the sacrotuberous ligament. In the repair of a perineal hernia, the ligament is used as an anchor point for suturing the muscles of the pelvic diaphragm, i.e. M. coccygeus (**12**) and M. levator ani (**5**), and entrapment of the ischiatic nerve is a potential hazard.

283 Caudal aspect of the anal region of a dog. The ducts of the anal sacs have been cannulated.

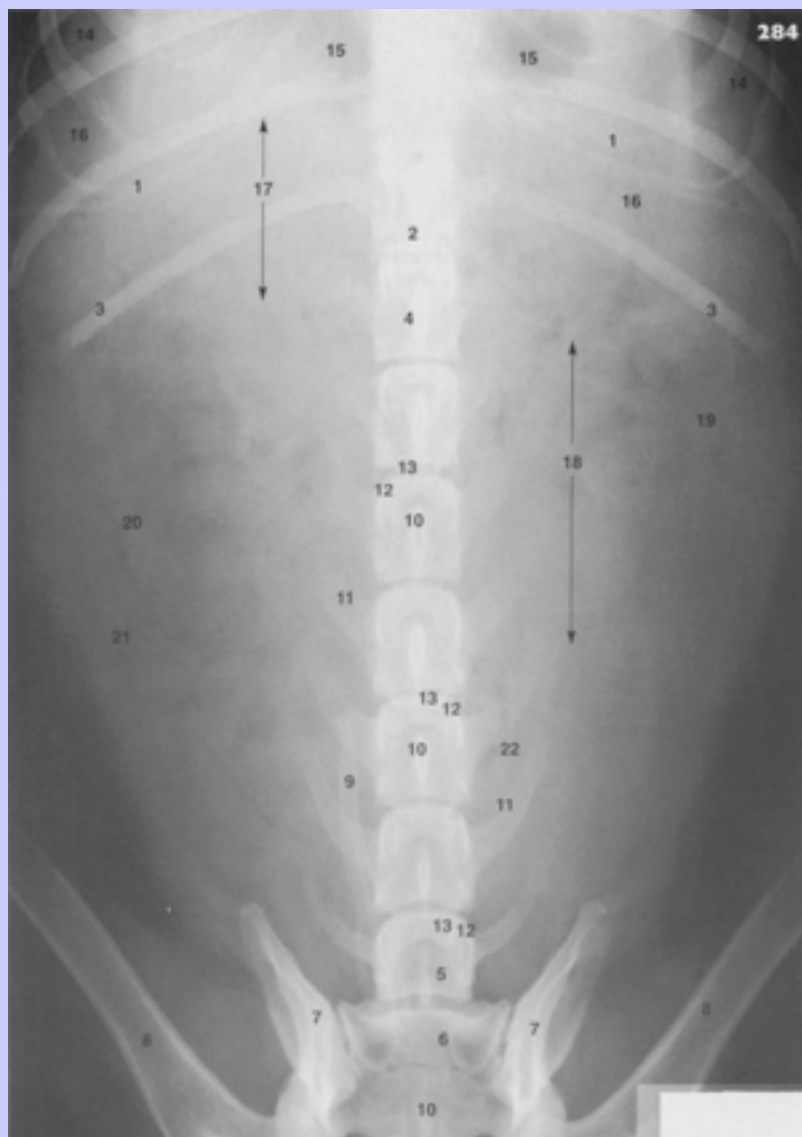


- 1 Tail
- 2 Anus (with cotton plug)
- 3 Cutaneous zone
- 4 Opening of anal sac (cannulated)
- 5 Elevations for openings of circumanal glands

168

169

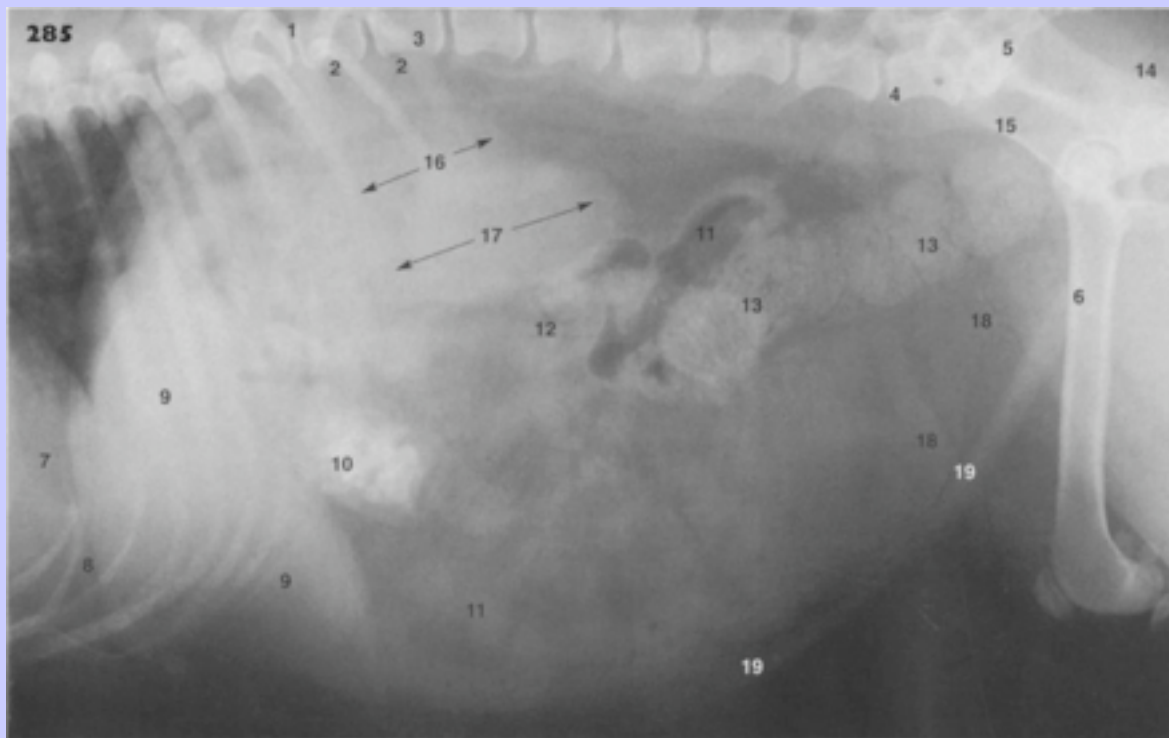
284 Radiograph of the abdominal region of a male dog in ventrodorsal positioning.



- 1 Costal arch
- 2 Thirteenth thoracic vertebra
- 3 Thirteenth (floating) rib
- 4 First lumbar vertebra
- 5 Seventh lumbar vertebra
- 6 Sacrum
- 7 Ilium
- 8 Femur
- 9 Os penis
- 10 Spinous process
- 11 Transverse process
- 12 Cranial articular process and mamillary process
- 13 Caudal articular process
- 14 Diaphragm
- 15 Stomach
- 16 Liver
- 17 Right kidney
- 18 Left kidney
- 19 Spleen
- 20 Jejunum
- 21 Caecum
- 22 Descending colon

285 Radiograph of the abdominal region of a male dog in lateral recumbency.

170



- 1 Thirteenth thoracic vertebra
- 2 Thirteenth (floating) rib
- 3 First lumbar vertebra
- 4 Seventh lumbar vertebra
- 5 Sacrum
- 6 Femur
- 7 Heart
- 8 Diaphragm
- 9 Liver
- 10 Stomach
- 11 Jejunum
- 12 Region of ileocolic and caecolic junction

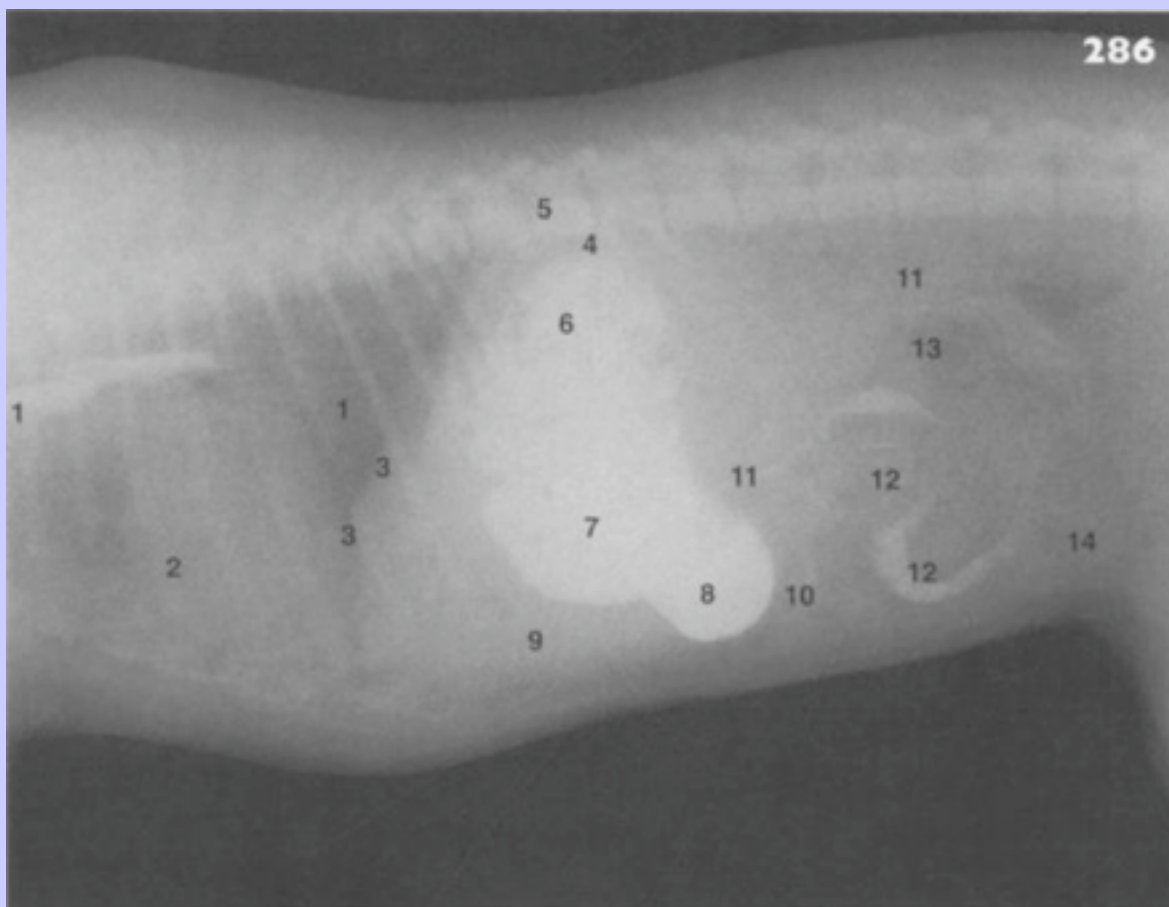
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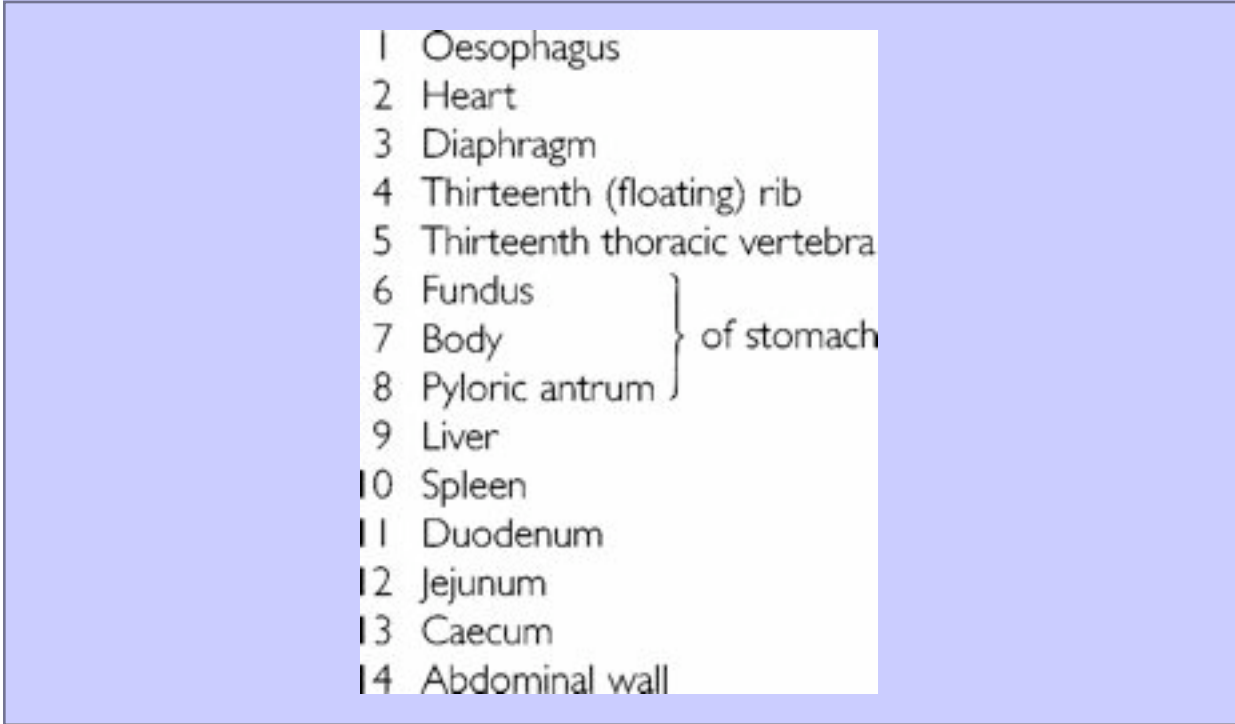
- 13 Descending colon
- 14 Rectum
- 15 Wing of ilium
- 16 Right kidney (arrows)
- 17 Left kidney (arrows)
- 18 Urinary bladder (distended, intra-abdominal)
- 19 Ventral abdominal wall

170

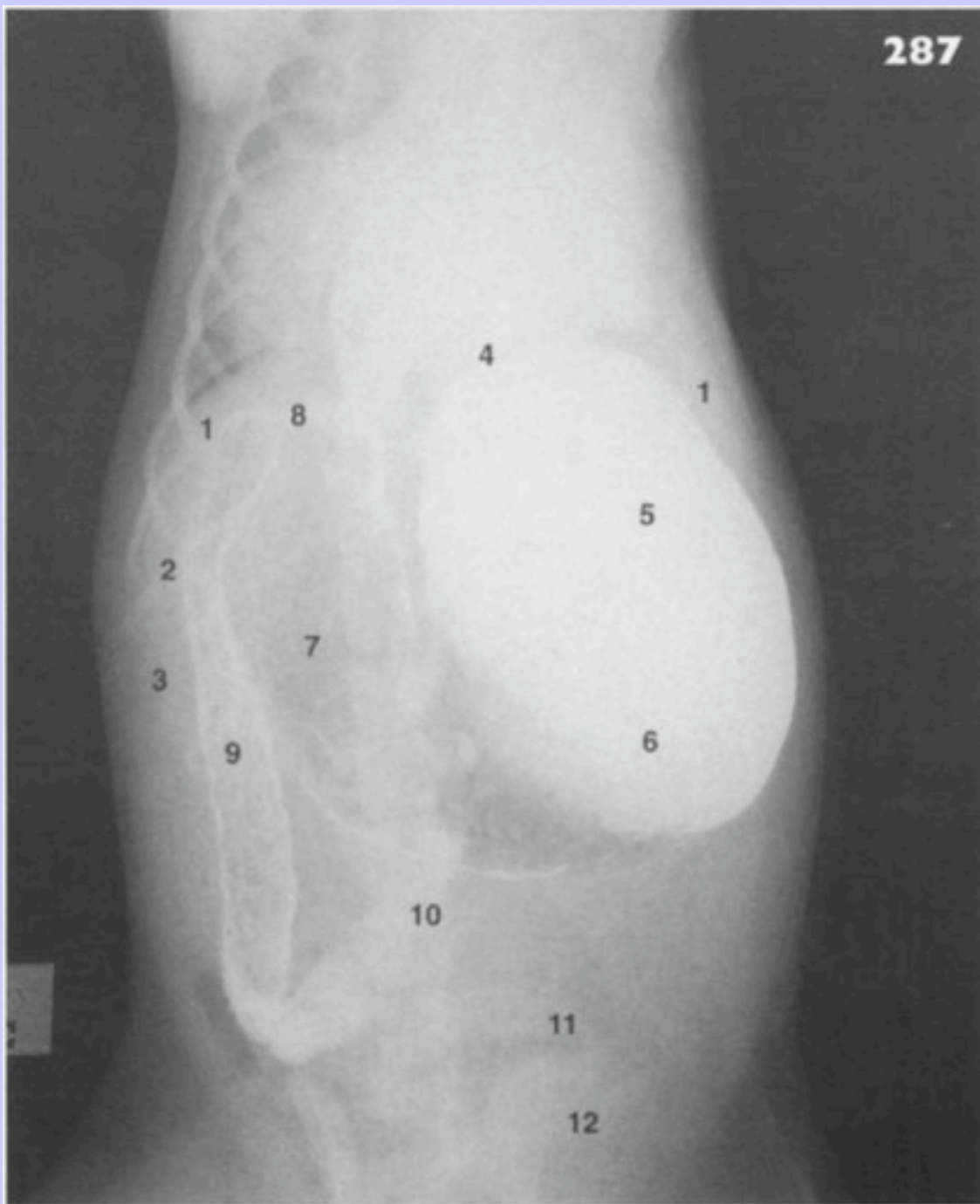
171

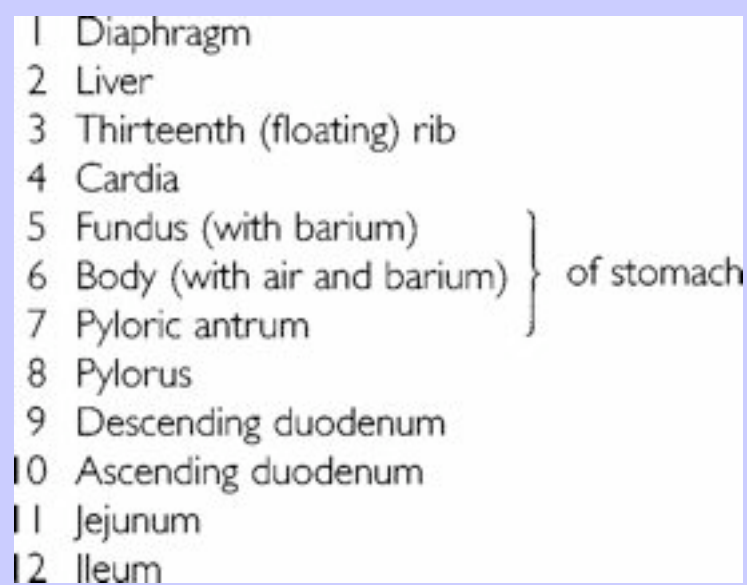
286 Radiograph of the lateral aspect of the thorax and abdomen of a dog. Barium has been administered by mouth, and is seen in the upper digestive tract.



- 
- 1 Oesophagus
2 Heart
3 Diaphragm
4 Thirteenth (floating) rib
5 Thirteenth thoracic vertebra
6 Fundus
7 Body
8 Pyloric antrum } of stomach
9 Liver
10 Spleen
11 Duodenum
12 Jejunum
13 Caecum
14 Abdominal wall

287 Ventrodorsal radiograph of the abdominal region of a dog in dorsal recumbency. Barium is lying intermingled with air in the stomach. The duodenum is outlined by barium filling, demonstrating the typical villous lining.

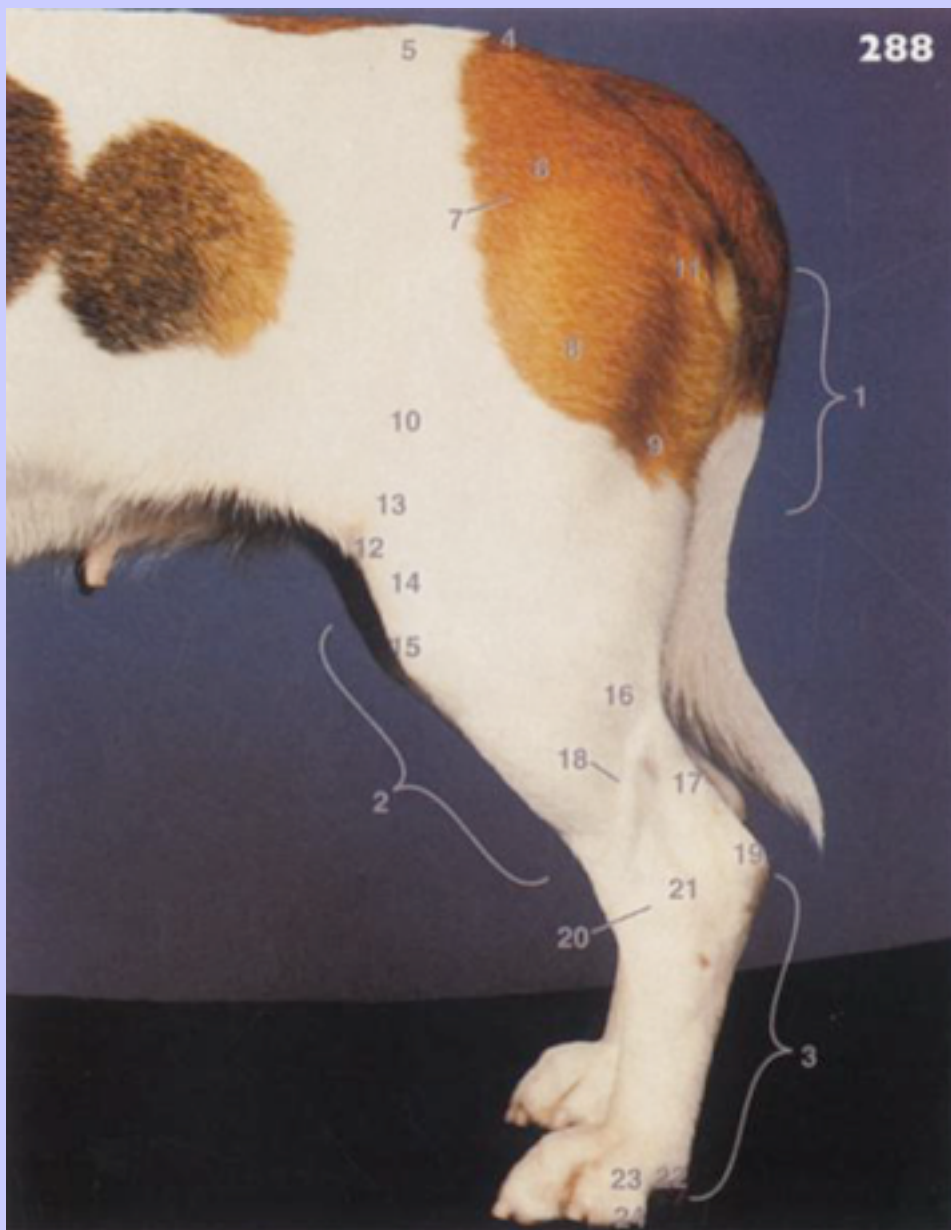


- 
- 1 Diaphragm
 - 2 Liver
 - 3 Thirteenth (floating) rib
 - 4 Cardia
 - 5 Fundus (with barium)
 - 6 Body (with air and barium)
 - 7 Pyloric antrum
 - 8 Pylorus
 - 9 Descending duodenum
 - 10 Ascending duodenum
 - 11 Jejunum
 - 12 Ileum
- } of stomach

7 PELVIC LIMB

Working from the proximal pelvic region distally to the pes, the osteological details of each area of the pelvic limb are illustrated using bones, displayed both singly and in an articulated form, and radiographs. The relevant musculature is then exhibited. Contrast arteriograms and venograms are used to give an overview of the vascular supply, while nerve trunks are named where they appear in the dissected specimens.

288 Lateral aspect of the left pelvic limb of a standing live dog, demonstrating palpable landmarks.



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- 1 Femoral region (thigh)
- 2 Crus
- 3 Pes
- 4 Median crest of sacrum
- 5 Cranial dorsal iliac spine
- 6 Greater trochanter
- 7 Level of hip joint
- 8 M. biceps femoris
- 9 M. semitendinosus
- 10 M. quadriceps femoris
- 11 Ischiatic tuberosity
- 12 Patella
- 13 Lateral epicondyle of femur
- 14 Stifle joint
- 15 Tibial tuberosity
- 16 M. gastrocnemius
- 17 Tendo calcaneus communis (Achilles)
- 18 Lateral saphenous vein (site of intravenous injection)
- 19 Calcaneal tuberosity
- 20 Tarsal joint (hock)
- 21 Lateral malleolus of fibula
- 22 Metatarsal pad
- 23 Fifth digit
- 24 Digital pad

7.0.1

Clinical Note

5, 6 & 11 These palpable bony prominences are used to verify the symmetry of the pelvic girdle during clinical examination for fracture of the ossa coxae or hip dislocation. The relative position of the three landmarks is compared on both sides.

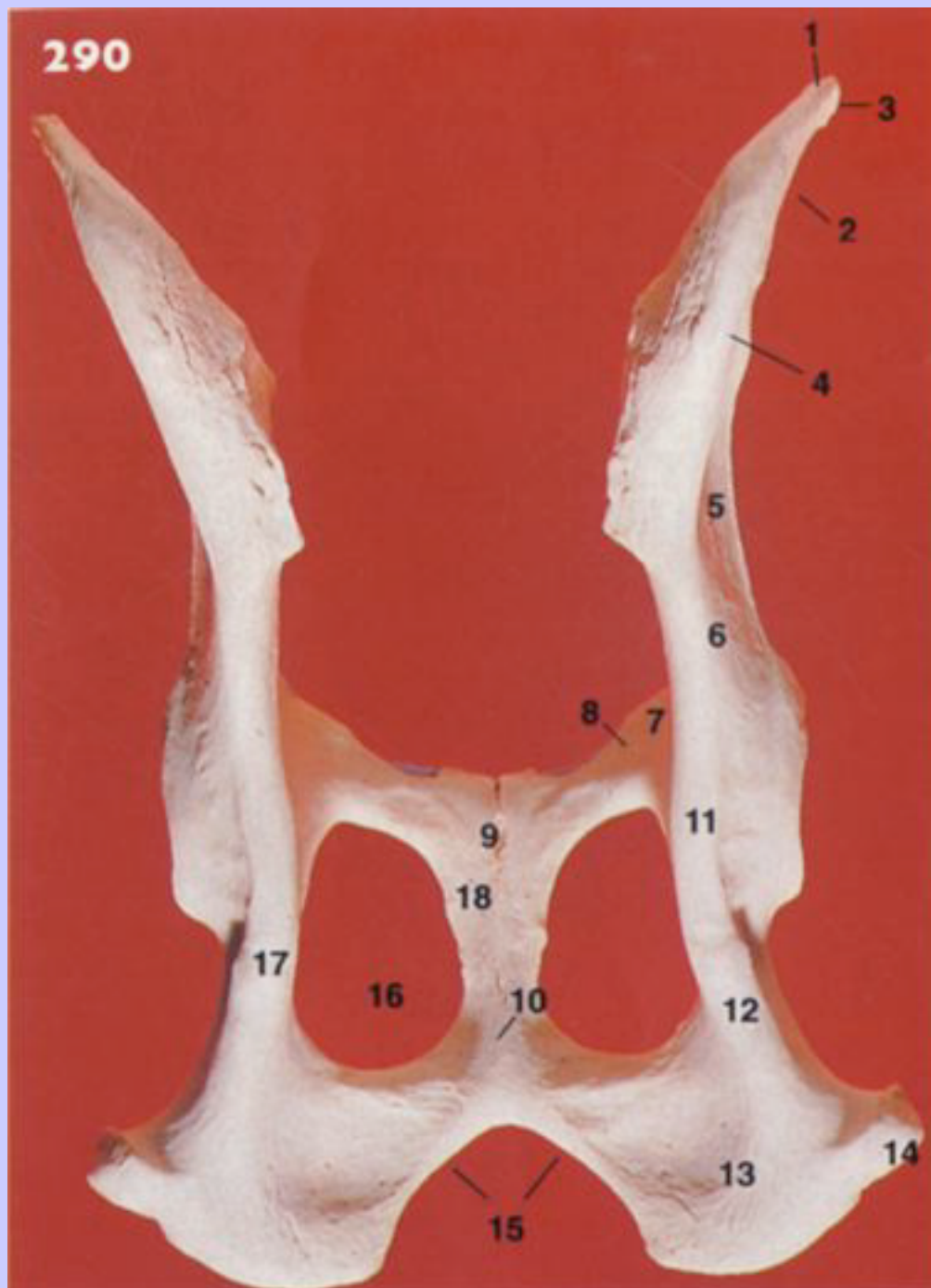
289 Caudal aspect of a standing live dog, demonstrating palpable landmarks. The palmar aspect of the manus of the thoracic limb is also shown.



1	Femoral region (thigh)	15	Calcaneal tuberosity	
2	Crus	16	Tarsal joint (hock)	
3	Pes	17	Metatarsal pad	
4	Perineum	18	Second digit	
5	Greater trochanter	19	Fifth digit	
6	Gluteal muscle mass	20	Digital pad	
7	Ischiatic tuberosity	21	Medial styloid process of radius	} thoracic limb
8	M. biceps femoris	22	Carpal joint	
9	M. semitendinosus	23	Carpal pad	
10	Stifle joint	24	Accessory carpal bone	
11	M. gastrocnemius and M. flexor digitorum superficialis	25	First digit (dew claw)	
12	Tendo calcaneus communis (Achilles)	26	Metacarpal pad	
13	Lateral malleolus of fibula	27	Fifth digit	
14	Medial malleolus of tibia			

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290 Dorsal aspect of the fused ossa coxae of a dog.



1 Iliac crest

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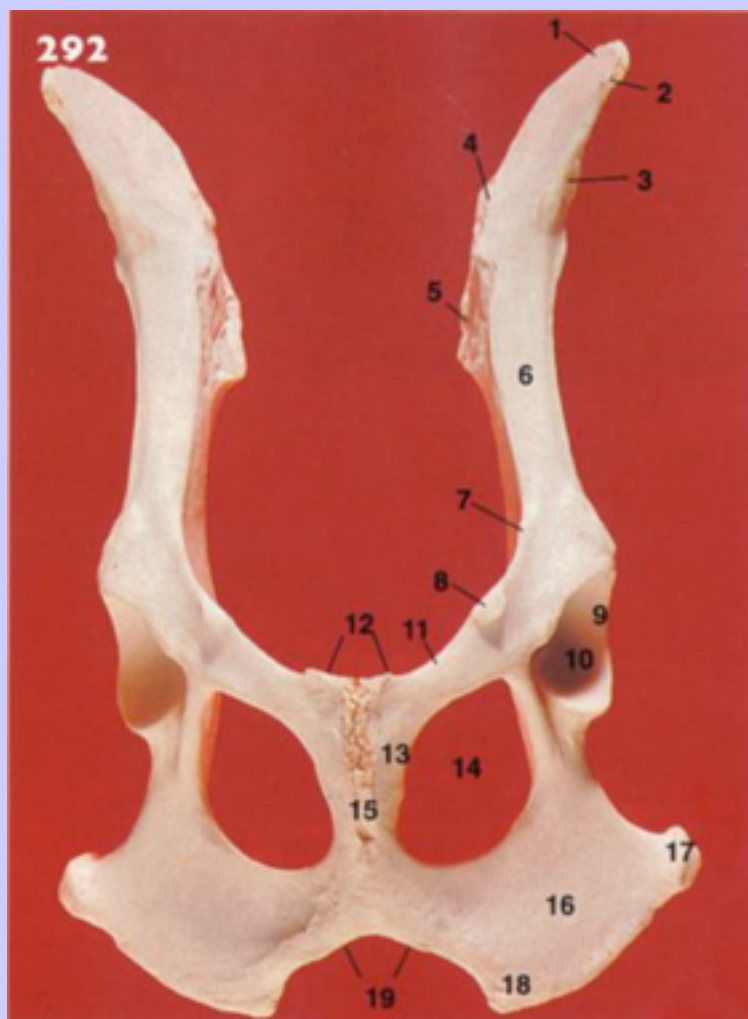
- 2 Wing of ilium
- 3 Cranial dorsal iliac spine
- 4 Caudal dorsal iliac spine
- 5 Body of ilium
- 6 Greater ischiatic notch
- 7 Iliopubic eminence
- 8 Pecten of pubic bone
- 9 Symphysis pubis
- 10 Symphysis ischii
- 11 Ischiatic spine
- 12 Lesser ischiatic notch
- 13 Ischiatic table
- 14 Ischiatic tuberosity
- 15 Ischiatic arch
- 16 Obturator foramen
- 17 Grooves for M. obturatorius internus
- 18 Pubis

291 Dorsal aspect of the fused ossa coxae of a cat.



- | | | |
|------------------------------|-------------------------|-----------------------|
| 1 Wing of ilium | 10 Ischiatic table | |
| 2 Cranial dorsal iliac spine | 11 Ischiatic tuberosity | |
| 3 Caudal dorsal iliac spine | 12 Symphysis ischii | } symphysis
pelvis |
| 4 Body of ilium | 13 Symphysis pubis | |
| 5 Greater ischiatic notch | 14 Obturator foramen | |
| 6 Ischiatic spine | 15 Pubis | |
| 7 Lesser ischiatic notch | 16 Arcuate line | |
| 8 Ischium | 17 Pecten of pubic bone | |
| 9 Ischiatic arch | | |

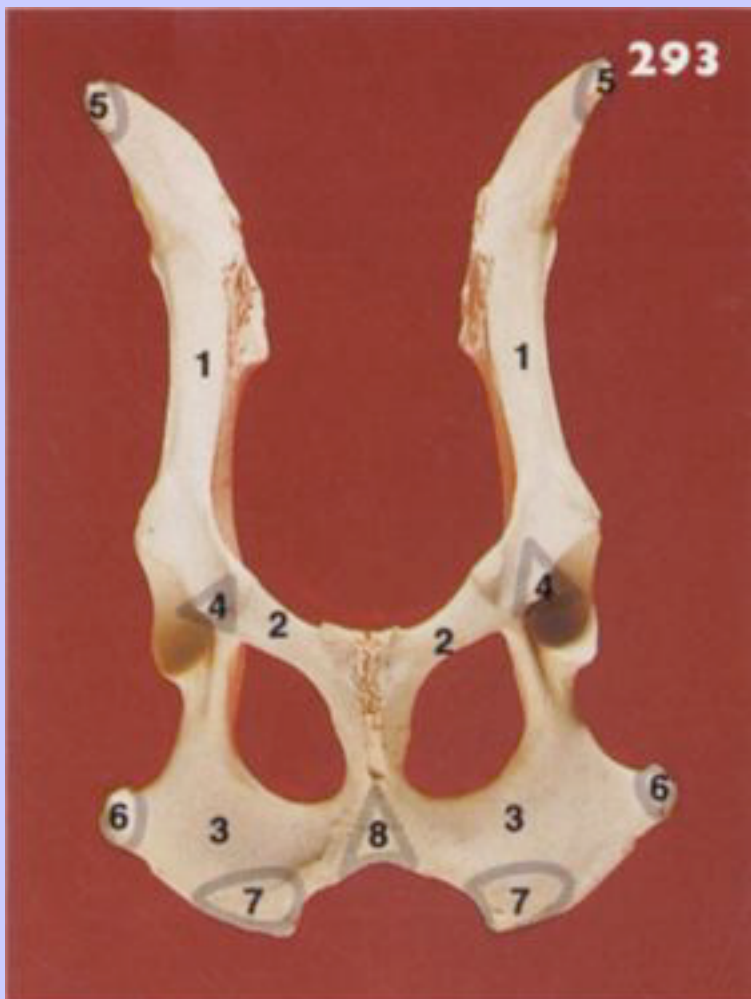
292 Ventral aspect of the fused ossa coxae of a dog.



- 1 Iliac crest
- 2 Cranial ventral iliac spine
- 3 Caudal ventral iliac spine
- 4 Iliac tuberosity
- 5 Auricular surface
- 6 Body of Ilium
- 7 Arcuate line
- 8 Iliopubic eminence
- 9 Lunate surface of acetabulum
- 10 Acetabular fossa
- 11 Pecten of pubic bone
- 12 Pubic tubercle
- 13 Pubis
- 14 Obturator foramen
- 15 Symphysis pelvis
- 16 Ischium
- 17 Ischiatic tuberosity
- 18 Medial angle of 17
- 19 Ischiatic arch

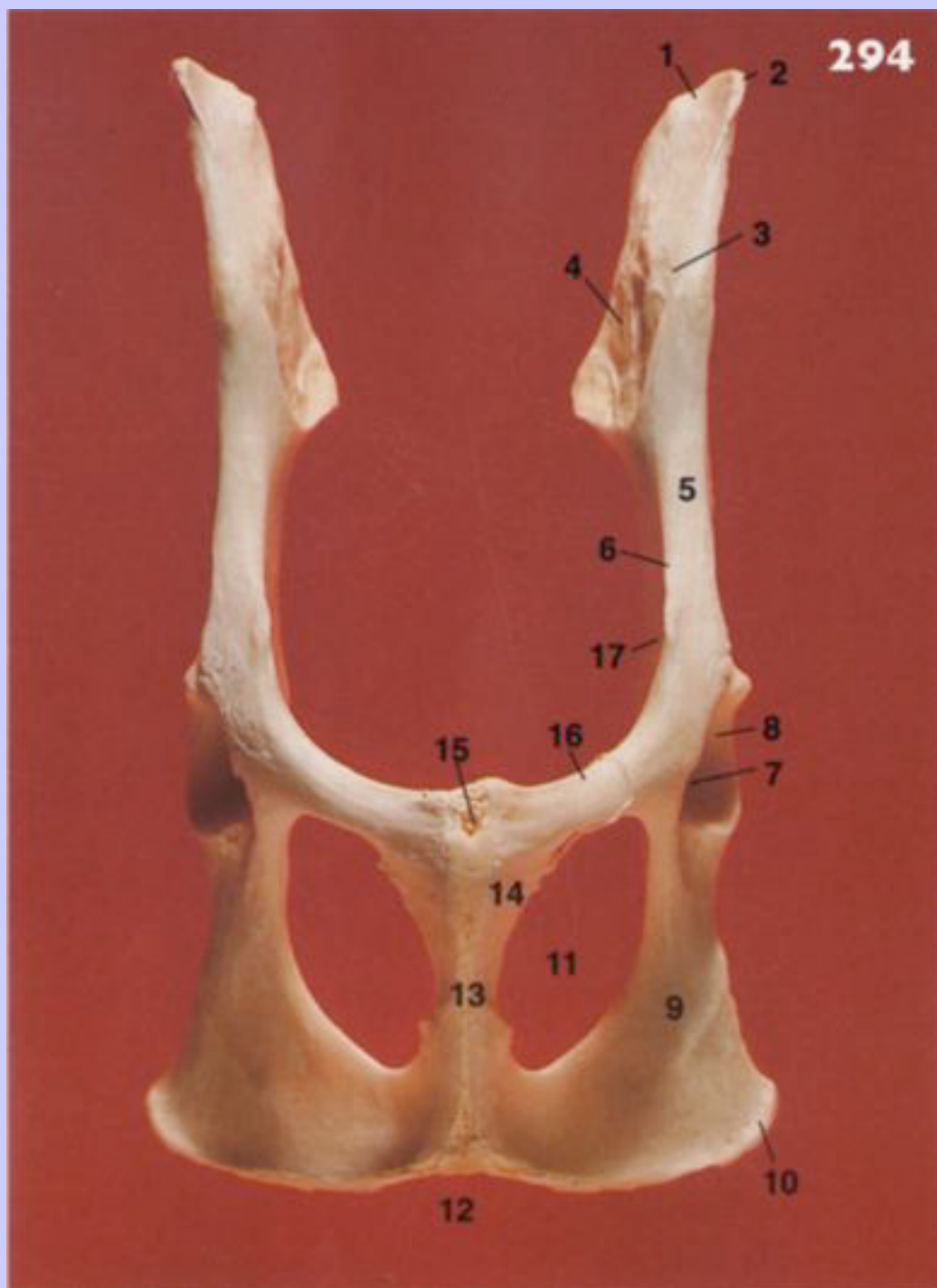
174

293 Ventral aspect of the fused ossa coxae of a dog, showing the centres of ossification.



- 1 Body of ilium
- 2 Body of pubis
- 3 Body of ischium
- 4 Acetabular bone
- 5 Iliac crest
- 6 Ischiatic tuberosity
- 7 Ischiatic arch

294 Ventral aspect of the fused ossa coxae of a cat.



- 1 Iliac crest
- 2 Cranial ventral iliac spine
- 3 Caudal ventral iliac spine
- 4 Auricular surface
- 5 Body of ilium
- 6 Arcuate line
- 7 Acetabular fossa
- 8 Lunate surface of acetabulum
- 9 Body of ischium
- 10 Ischiatic tuberosity
- 11 Obturator foramen
- 12 Ischiatic arch
- 13 Symphysis pelvis
- 14 Pubis
- 15 Pubic tubercle
- 16 Pecten of pubic bone
- 17 Iliopubic eminence

175

295 Lateral aspect of the left os coxae of a cat.

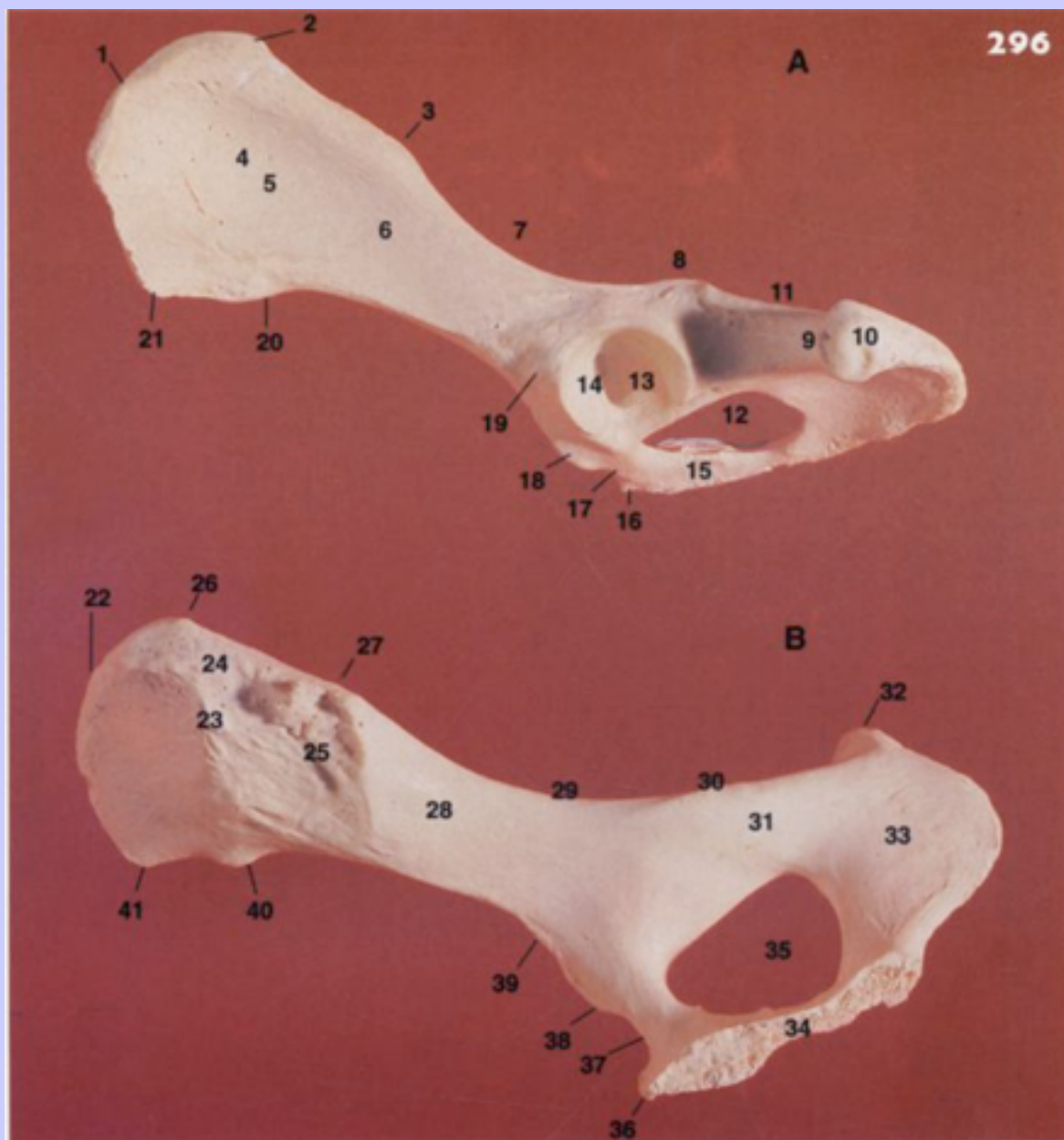
176



- 1 Cranial dorsal iliac spine
- 2 Caudal dorsal iliac spine
- 3 Body of ilium
- 4 Greater ischiatic notch
- 5 Ischiatic spine
- 6 Acetabular fossa
- 7 Lunate surface of acetabulum
- 8 Acetabular incisura
- 9 Lesser ischiatic notch
- 10 Body of ischium
- 11 Ischiatic tuberosity
- 12 Obturator foramen
- 13 Pubis
- 14 Pubic tubercle
- 15 Pecten of pubic bone
- 16 Iliopubic eminence
- 17 Cranial ventral iliac spine
- 18 Caudal ventral iliac spine

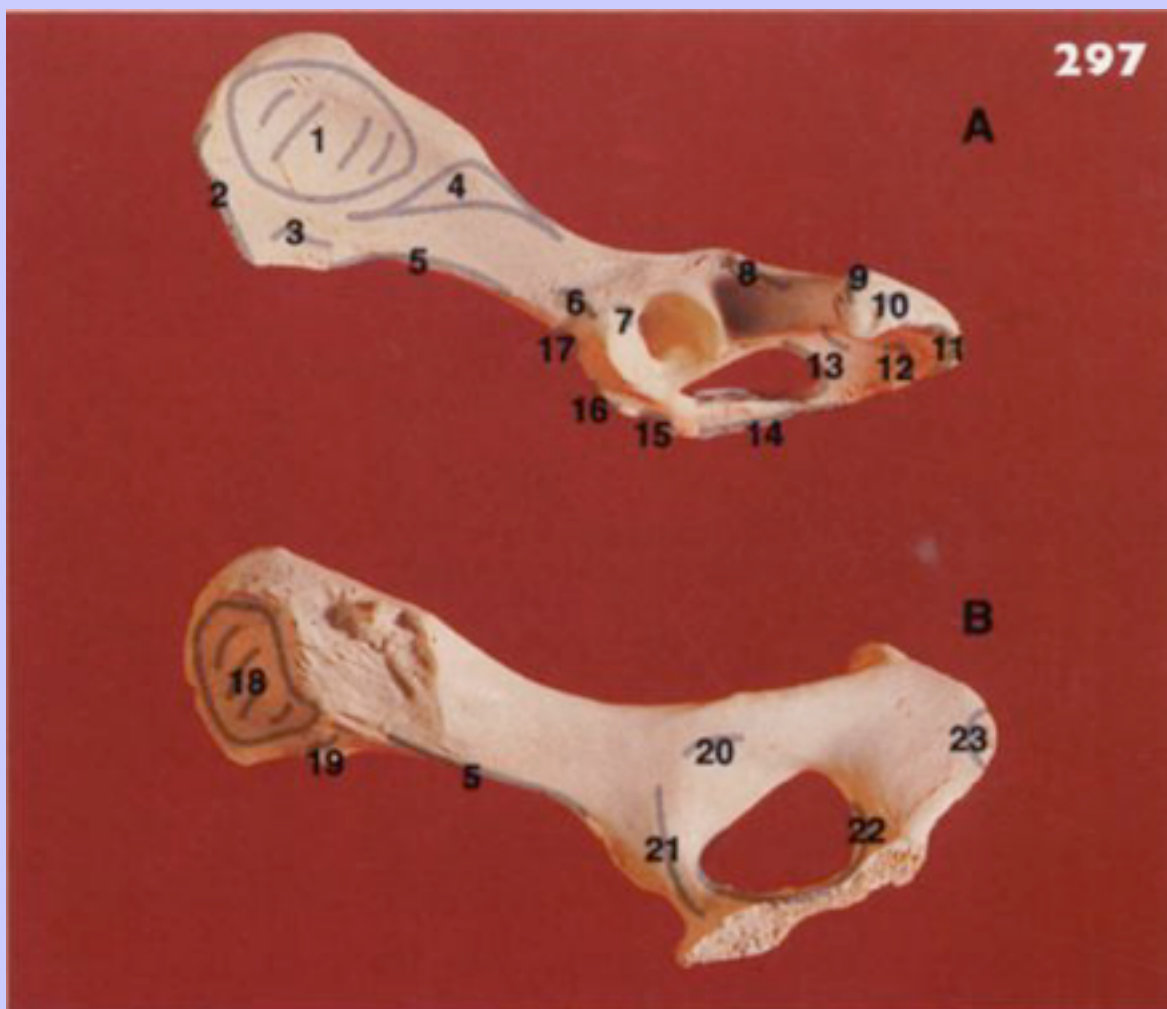
176

296 Lateral aspect of the left os coxae (A) and medial aspect of the right os coxae (B) of a dog.



- 1 Iliac crest
- 2 Cranial dorsal iliac spine
- 3 Caudal dorsal iliac spine
- 4 Wing
- 5 Gluteal surface
- 6 Body
- 7 Greater ischiatic notch
- 8 Ischiatic spine
- 9 Ischium
- 10 Ischiatic tuberosity
- 11 Lesser ischiatic notch
- 12 Obturator foramen
- 13 Acetabular fossa
- 14 Lunate surface of acetabulum
- 15 Pubis
- 16 Pubic tubercle
- 17 Pecten of pubic bone
- 18 Iliopubic eminence
- 19 Tuberosity for M. rectus femoris
- 20 Caudal ventral iliac spine
- 21 Cranial ventral iliac spine
- 22 Iliac tuberosity
- 23 Sacroiliac joint
- 24 Iliac tuberosity
- 25 Auricular surface
- 26 Cranial dorsal iliac spine
- 27 Caudal dorsal iliac spine
- 28 Body of ilium
- 29 Greater ischiatic notch
- 30 Ischiatic spine
- 31 Grooves for M. obturatorius internus
- 32 Ischiatic tuberosity
- 33 Ischiatic table
- 34 Symphysis pelvis
- 35 Obturator foramen
- 36 Pubic tubercle
- 37 Pecten of pubic bone
- 38 Iliopubic eminence
- 39 Arcuate line
- 40 Caudal ventral iliac spine
- 41 Cranial ventral iliac spine

297 Lateral aspect of the left os coxae (A) and medial aspect of the right os coxae (B) of a dog, showing areas of muscle attachment.



- 1 Middle gluteal
- 2 Sartorius
- 3 Tensor fasciae latae
- 4 Deep gluteal
- 5 Iliacus
- 6 Rectus femoris
- 7 Articularis coxae

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- 8 Gemelli
- 9 Biceps femoris
- 10 Semitendinosus
- 11 Semimembranosus
- 12 Quadratus femoris
- 13 Obturatorius externus
- 14 Adductor and gracilis
- 15 Rectus abdominis
- 16 Pectineus
- 17 Psoas minor
- 18 Iliocostalis and longissimus lumborum
- 19 Quadratus lumborum
- 20 Coccygeus
- 21 Levator ani
- 22 Obturatorius internus
- 23 Ischiocavernosus

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298 Lateral aspect of the left femur (A) and medial aspect of the right femur (B) of a dog.



- 1 Head
- 2 Greater trochanter
- 3 Third trochanter (rudimentary)
- 4 Lateral lip
- 5 Lateral supracondylar tuberosity
- 6 Lateral trochlear ridge
- 7 Lateral epicondyle
- 8 Lateral condyle
- 9 Extensor fossa
- 10 Patella
- 11 Fovea
- 12 Lesser trochanter
- 13 Medial lip
- 14 Body
- 15 Medial trochlear ridge
- 16 Medial supracondylar tuberosity
- 17 Medial epicondyle
- 18 Medial condyle
- 19 Patella

299 Lateral aspect of the left femur (A) and medial aspect of the right femur (B) of a dog, showing the centres of ossification.



1 Body of femur

2 Proximal

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3 Greater trochanter

4 Lesser trochanter

5 Distal

6 Patella


178

179

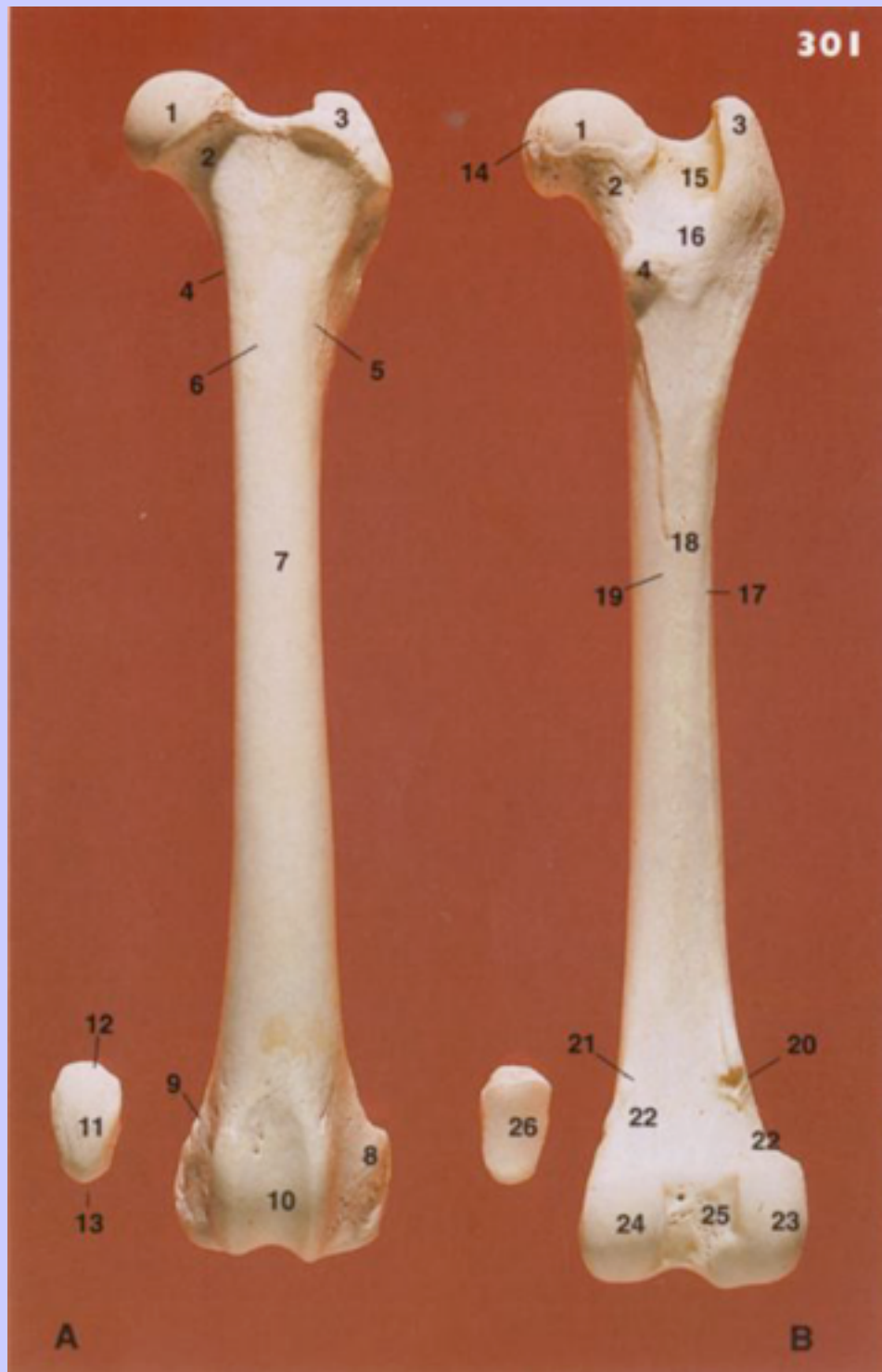
300 Lateral aspect of the left femur (A) and medial aspect of the right femur (B) of a cat.



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- 
- 1 Head
 - 2 Greater trochanter
 - 3 Lesser trochanter
 - 4 Body
 - 5 Lateral epicondyle
 - 6 Lateral condyle
 - 7 Extensor fossa
 - 8 Trochlea
 - 9 Fovea
 - 10 Neck
 - 11 Medial epicondyle
 - 12 Medial condyle

301 Cranial aspect of the left femur (A) and caudal aspect of the right femur (B) of a dog. The cranial and caudal aspects of the patella are also displayed.



- 1 Head
- 2 Neck
- 3 Greater trochanter
- 4 Lesser trochanter
- 5 Line of M. vastus lateralis
- 6 Line of M. vastus medialis
- 7 Body
- 8 Lateral epicondyle
- 9 Medial epicondyle
- 10 Trochlea
- 11 Patella
- 12 Base
- 13 Apex
- 14 Fovea
- 15 Trochanteric fossa
- 16 Intertrochanteric crest
- 17 Lateral lip
- 18 Roughened facie (facies aspera)
- 19 Medial lip
- 20 Lateral supracondylar tuberosity
- 21 Medial supracondylar tuberosity
- 22 Area of articulation of sesamoids (fabellae)
- 23 Lateral condyle
- 24 Medial condyle
- 25 Intercondylar fossa
- 26 Articular surface of patella

302 Cranial aspect of the left femur (A) and caudal aspect of the right femur (B) of a dog, showing areas of muscle attachment.



- | | |
|---------------------------------------|--|
| 1 Gluteus medius | 11 Quadratus femoris |
| 2 Gluteus profundus | 12 Adductor longus |
| 3 Vastus lateralis and
intermedius | 13 Iliopsoas |
| 4 Articularis coxae | 14 Adductor magnus and brevis |
| 5 Vastus medialis | 15 Pectineus |
| 6 Articularis genus | 16 Semimembranosus |
| 7 Flexor digitorum longus | 17 Lateral head } of |
| 8 Popliteus | 18 Medial head } gastrocnemius |
| 9 Piriformis and gluteus medius | 19 Flexor digitorum superficialis |
| 10 Gluteus superficialis | 20 Gemelli and obturatorius
internus and externus |

180

303 Cranial aspect (A) of the left femur and caudal aspect (B) of the right femur of a cat.

181



- | | |
|-------------------------------|---------------------------------|
| 1 Head | 11 Fovea |
| 2 Neck | 12 Trochanteric fossa |
| 3 Greater trochanter | 13 Greater trochanter |
| 4 Body | 14 Lesser trochanter |
| 5 Line of M. vastus lateralis | 15 Intertrochanteric crest |
| 6 Medial epicondyle | 16 Popliteal surface |
| 7 Lateral epicondyle | 17 Medial condyle |
| 8 Trochlea | 18 Lateral condyle |
| 9 Base | 19 Intercondylar fossa |
| 10 Apex | 20 Articular surface of patella |
- } of patella

304 Proximal and distal extremities of the femur of a dog.



- 1 Fovea
- 2 Head
- 3 Greater trochanter
- 4 Trochanteric fossa
- 5 Lesser trochanter
- 6 Intertrochanteric crest

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- 7 Trochlea
- 8 Intercondylar fossa
- 9 Lateral condyle
- 10 Medial condyle

7.0.2

Clinical Note

- 4 This is the point at which an intramedullary pin is withdrawn and reinserted during reverse intramedullary pinning of a fractured femur. Because of the eccentric placement of the articular surface of the femoral head relative to the longitudinal dimension of the femoral body ([Fig. 301](#), 1, 2 & 7), it is possible to use a reverse pinning technique on the femur.

181

182

305 Lateral radiograph of the pelvic region of a bitch.



- 1 Wing of ilium
- 2 Cranial dorsal iliac spine
- 3 Caudal dorsal iliac spine
- 4 Cranial ventral iliac spine
- 5 Caudal ventral iliac spine
- 6 Body of ilium
- 7 Greater ischiatic notch
- 8 Ischiatic spine
- 9 Iliopectineal eminence
- 10 Pecten of pubis
- 11 Pubis
- 12 Symphysis pelvis
- 13 Obturator foramen
- 14 Acetabular notch
- 15 Acetabulum
- 16 Ischiatic arch
- 17 Ischiatic body
- 18 Ischiatic tuberosity
- 19 Lesser ischiatic notch
- 20 Head of femur
- 21 Hip joint
- 22 Greater trochanter
- 23 Lesser trochanter
- 24 Body of femur
- 25 Descending colon
- 26 Seventh lumbar vertebra

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- 27 Body of sixth lumbar vertebra
- 28 Transverse process
- 29 Accessory process
- 30 Caudal articular process
- 31 Cranial articular process
- 32 Spinous process
- 33 Intervertebral foramen
- 34 Vertebral canal
- 35 Wing of sacrum
- 36 Promontory
- 37 First caudal vertebra
- 38 Fifth caudal vertebra
- 39 Haemal arch
- 40 Rectum
- 41 Anus

182

306 Ventrodorsal radiograph of the pelvis of a male dog.



- 1 Wing } of ilium
- 2 Body }
- 3 Dorsal border
- 4 Ventral border
- 5 Caudal ventral iliac spine
- 6 Cranial ventral iliac spine
- 7 Iliac crest
- 8 Acetabular branch of pubis
- 9 Pecten of pubis
- 10 Iliopectineal eminence
- 11 Symphyseal branch of pubis
- 12 Symphyseal branch of ischium
- 13 Ischiatic table
- 14 Ischiatic tuberosity
- 15 Body of ischium
- 16 Lesser ischiatic notch
- 17 Ischiatic arch
- 18 Obturator foramen
- 19 Ischiatic spine
- 20 Dorsal acetabular border
- 21 Ventral acetabular border
- 22 Acetabular fossa and incisura
- 23 Cranial edge } of acetabular
- 24 Caudal edge } image
- 25 Head } of femur
- 26 Neck }
- 27 Greater trochanter
- 28 Trochanteric fossa
- 29 Lesser trochanter
- 30 Body of femur
- 31 Descending colon
- 32 Body of seventh lumbar vertebra
- 33 Spinous process
- 34 Transverse process
- 35 Wing of sacrum
- 36 Rectum
- 37 Spinous process of sacrum
- 38 Outline of os penis

307 Ventrodorsal radiograph of the pelvis and stifles of a puppy, showing the centres of ossification.

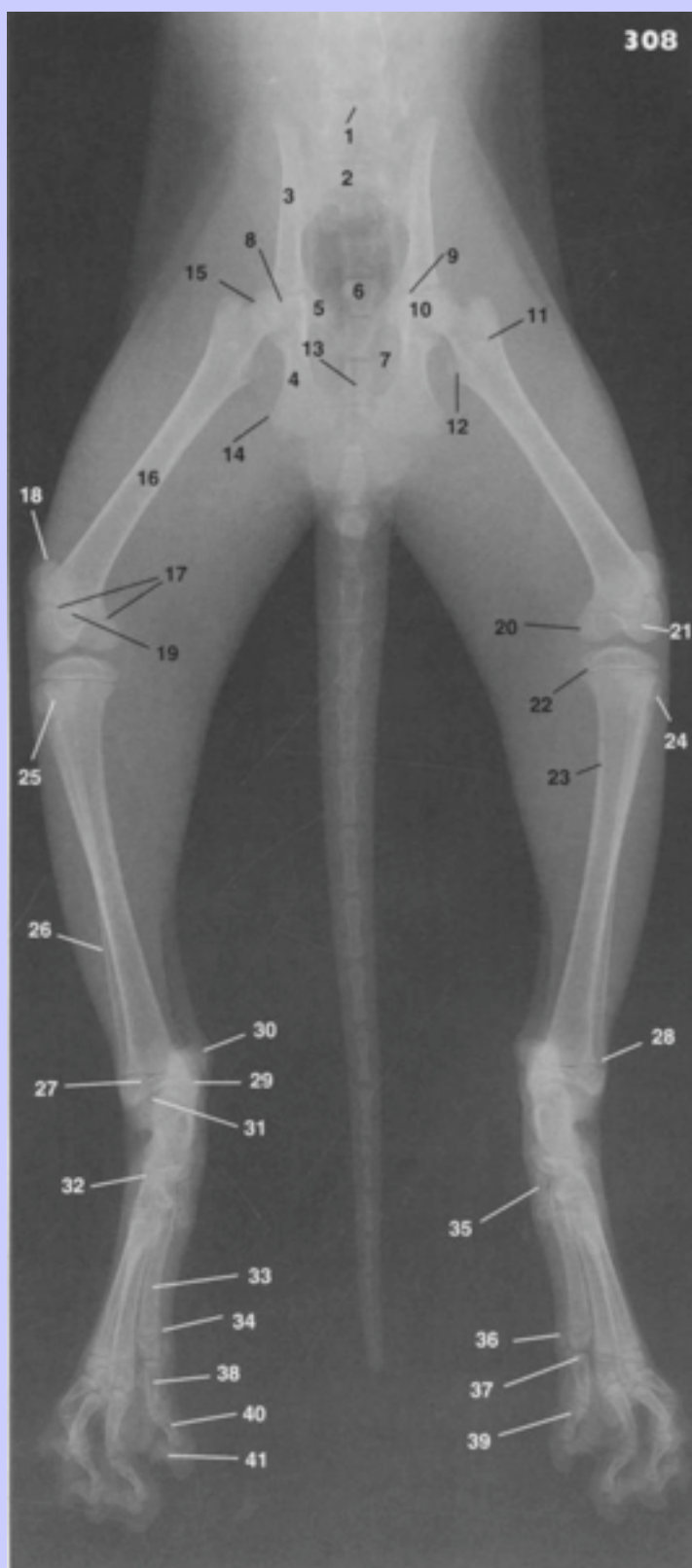


- 1 Iliac crest
- 2 Body of ilium
- 3 Pubis
- 4 Acetabular bone
- 5 Body of ischium
- 6 Ischiatic tuberosity
- 7 Head of femur
- 8 Greater trochanter
- 9 Lesser trochanter
- 10 Body of femur
- 11 Distal femoral epiphysis
- 12 Proximal tibial epiphysis
- 13 Proximal fibular epiphysis
- 14 Tibial tuberosity
- 15 Proximal femoral growth plate
- 16 Growth plate for greater trochanter
- 17 Distal femoral growth plate
- 18 Proximal tibial growth plate
- 19 Proximal fibular growth plate
- 20 Growth plate for tibial tuberosity
- 21 Patella in trochlea

184

308 Ventrodorsal radiograph of the pelvis and pelvic limbs of a 19-week-old kitten showing the centres of ossification.

185



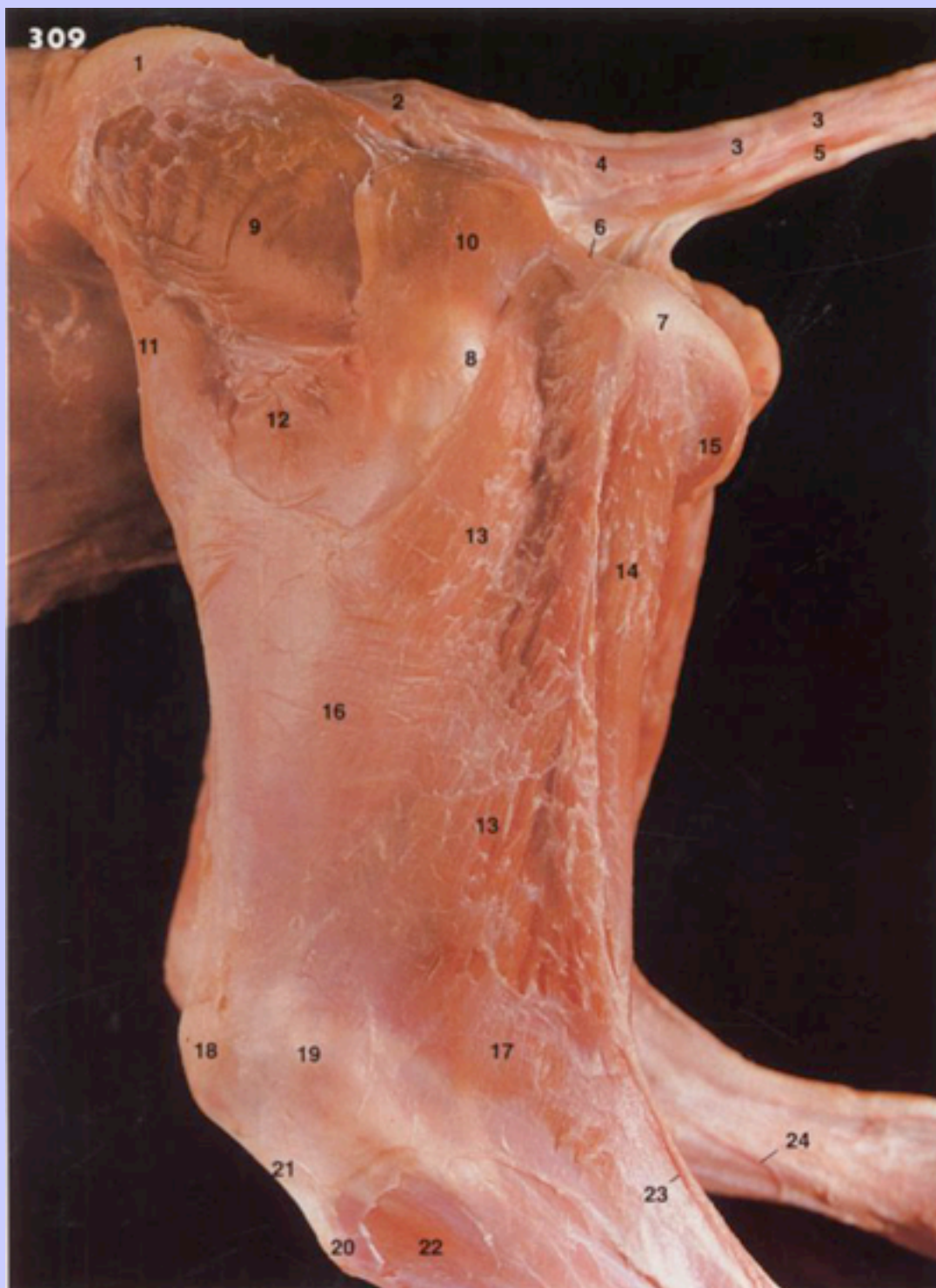
- 1 Cranial growth plate for the body of the seventh lumbar vertebra
- 2 Sacrum
- 3 Ilium
- 4 Ischium
- 5 Pubis
- 6 Body of second caudal vertebra
- 7 Obturator foramen
- 8 Acetabulum
- 9 Growth plate of acetabulum between bones 3, 4 and 5 and acetabular bone
- 10 Head of femur
- 11 Growth plate between the centre of ossification for the greater trochanter and the body of the femur
- 12 Lesser trochanter
- 13 Symphysis pelvis
- 14 Growth plate between the centre of ossification for the ischiatic tuberosity and the ischiatic table
- 15 Proximal femoral epiphysis
- 16 Body of femur
- 17 Distal femoral epiphysis
- 18 Patella
- 19 Fabella
- 20 Medial femoral condyle
- 21 Lateral femoral condyle
- 22 Proximal tibial epiphysis
- 23 Body of tibia
- 24 Growth plate between the body of tibia and the tibial tuberosity
- 25 Proximal fibular epiphysis
- 26 Body of fibula

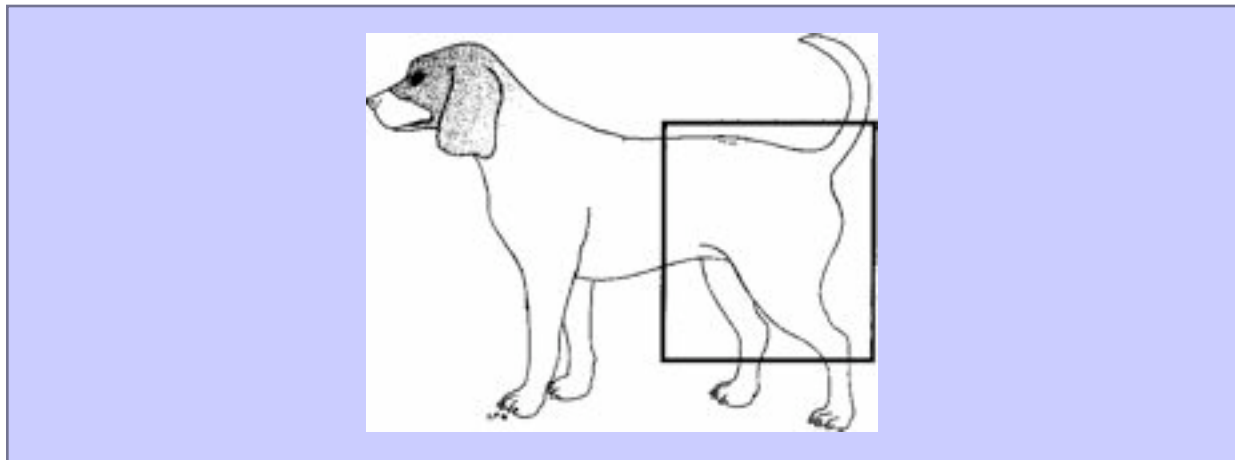
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- 27 Distal epiphysis of tibia
- 28 Distal epiphysis of fibula
- 29 Body of calcaneus
- 30 Centre of ossification for the calcaneal tuberosity
- 31 Talus
- 32 Distal row of tarsal bones
- 33 Second to fifth metatarsal bones
- 34 Distal epiphysis of metatarsal bone
- 35 Bony elements of first digit
- 36 Proximal sesamoid bones
- 37 Proximal epiphysis of proximal phalanx
- 38 Body of proximal phalanx
- 39 Proximal epiphysis of middle phalanx
- 40 Body of middle phalanx
- 41 Body of distal phalanx

185

309 Lateral aspect of the pelvic and thigh regions of the left pelvic limb of a dog. The skin has been removed to reveal the superficial muscles.





- 1 Dorsal iliac spine
- 2 Sacrum
- 3 Caudal vertebrae
- 4 Mm. intertransversarii dorsales caudalis
- 5 Mm. intertransversarii ventrales caudalis
- 6 Sacrotuberous ligament
- 7 Ischiatic tuberosity
- 8 Greater trochanter
- 9 M. gluteus medius
- 10 M. gluteus superficialis
- 11 M. sartorius
- 12 M. tensor fasciae latae
- 13 M. biceps femoris
- 14 M. semitendinosus
- 15 M. semimembranosus
- 16 Fascia lata extending to stifle
- 17 Continuation of M. biceps femoris
- 18 Patella in trochlear groove

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19 Lateral epicondyle of femur

20 Tibial tuberosity

21 Patellar ligament

22 M. tibialis cranialis

23 Lateral saphenous vein

24 Medial saphenous vein

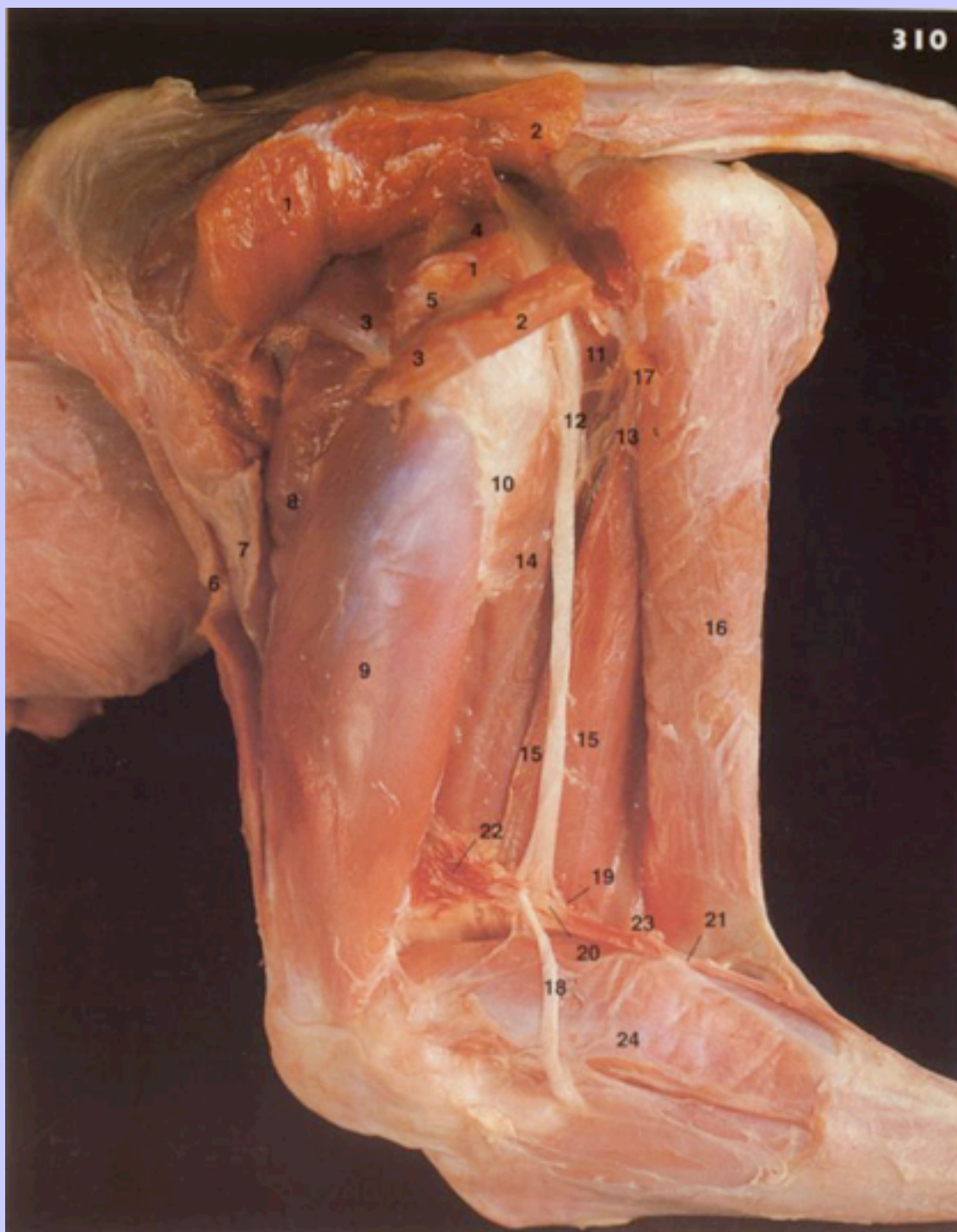
7.0.3

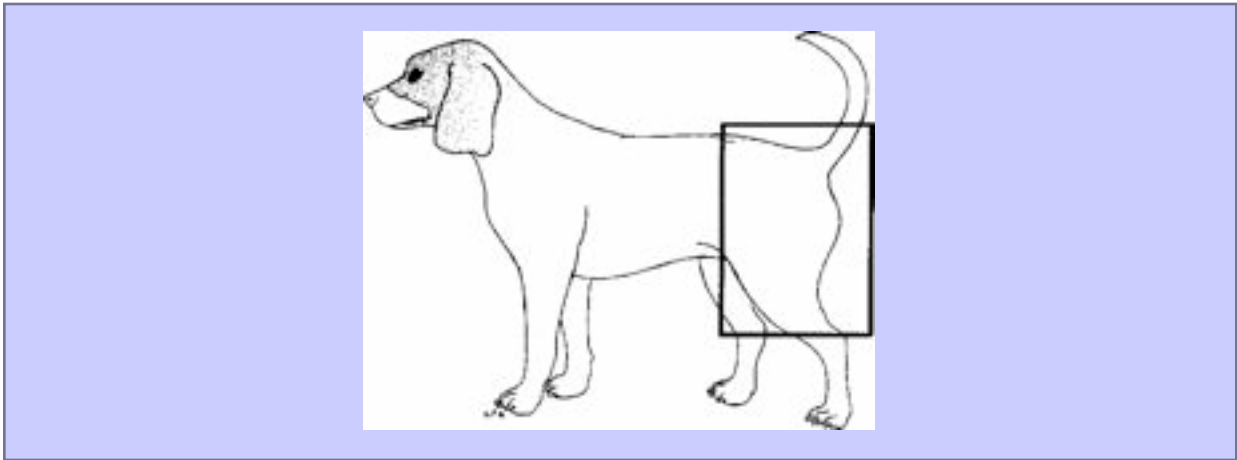
Clinical Note

16 This is the approach for exposing the midshaft of the femur. The incision is made along the line of fusion of the fascia lata and the cranial edge of the biceps femoris muscle.

186

310 Lateral aspect of the pelvic and thigh regions of the left pelvic limb of a dog. The fascia lata and biceps femoris muscle have been removed to reveal the deeper muscles. The gluteal muscles have been reflected dorsally.





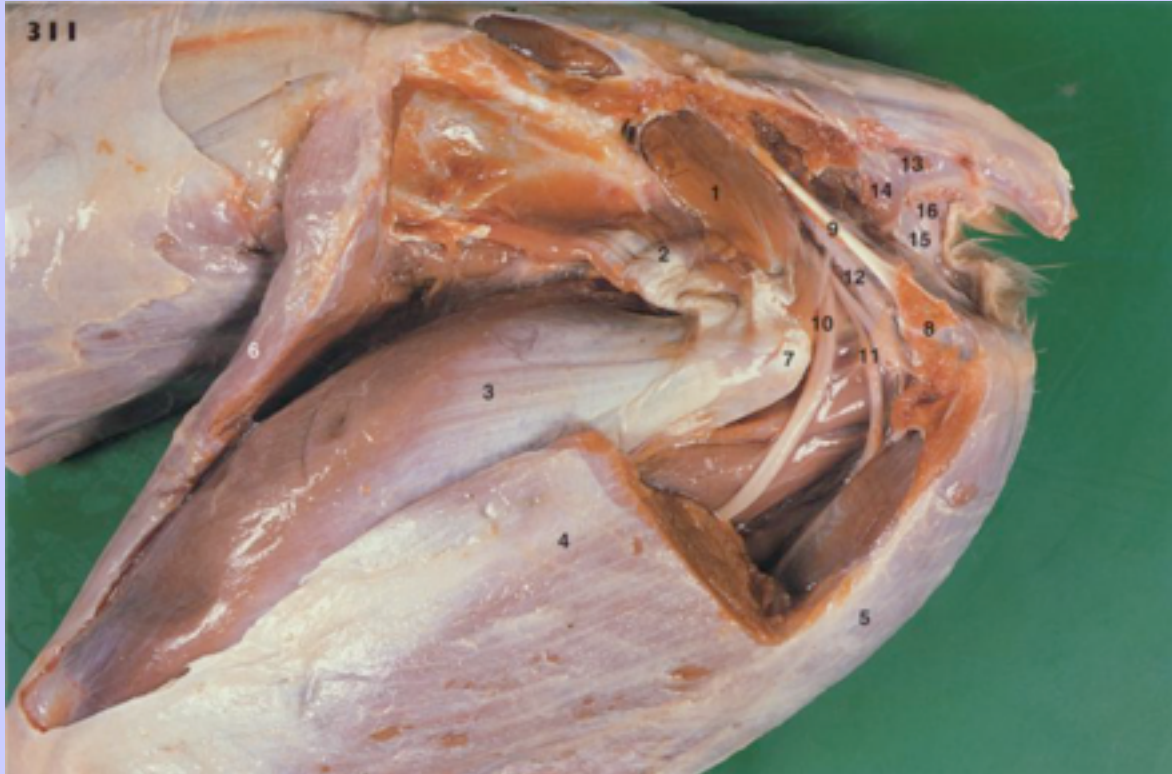
1 M. gluteus medius	} (cut)	10 Femur	18 Common peroneal (fibular) nerve
2 M. gluteus superficialis		11 M. quadratus femoris	19 Caudal cutaneous sural nerve
3 M. gluteus profundus		12 Ischiatic nerve	20 Tibial nerve
4 M. piriformis		13 Caudal gluteal artery and vein	21 Lateral saphenous vein
5 Hip joint capsule		14 M. adductor	22 Femoral artery and vein
6 M. sartorius		15 M. semimembranosus	23 Popliteal lymph node
7 M. tensor fasciae latae		16 M. semitendinosus	24 M. gastrocnemius
8 M. rectus femoris		17 M. abductor cruris caudalis (cut proximal end)	
9 M. vastus lateralis			

7.0.4

Clinical Note

- 1, 2 & 3 The tendons of insertion of the gluteal muscles onto or over the greater trochanter have been sectioned in the manner used in a dorsal surgical approach to the hip joint.
- 12 Note the course of this nerve as it runs through the region caudal to the hip joint. The nerve must be identified and conserved during surgery of the hip joint.

311 Lateral aspect of the pelvic region of the left pelvic limb of a dog. The superficial and middle gluteal muscles have been removed to reveal the deep gluteal muscle. The fascia lata and its tensor muscle along with the proximal segment of the biceps femoris muscle have been removed to reveal the quadriceps group of muscles.



- 1 M. piriformis
- 2 M. gluteus profundus
- 3 M. vastus lateralis
- 4 M. biceps femoris (cut)
- 5 M. semitendinosus
- 6 M. sartorius
- 7 Greater trochanter
- 8 Ischiatic tuberosity

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- 9 Sacrotuberous ligament
- 10 Ischiatic nerve
- 11 Branch of 10 running to 4 & 5
- 12 Caudal gluteal artery and vein
- 13 M. levator ani
- 14 M. coccygeus
- 15 Position of anal sac
- 16 M. sphincter ani externus

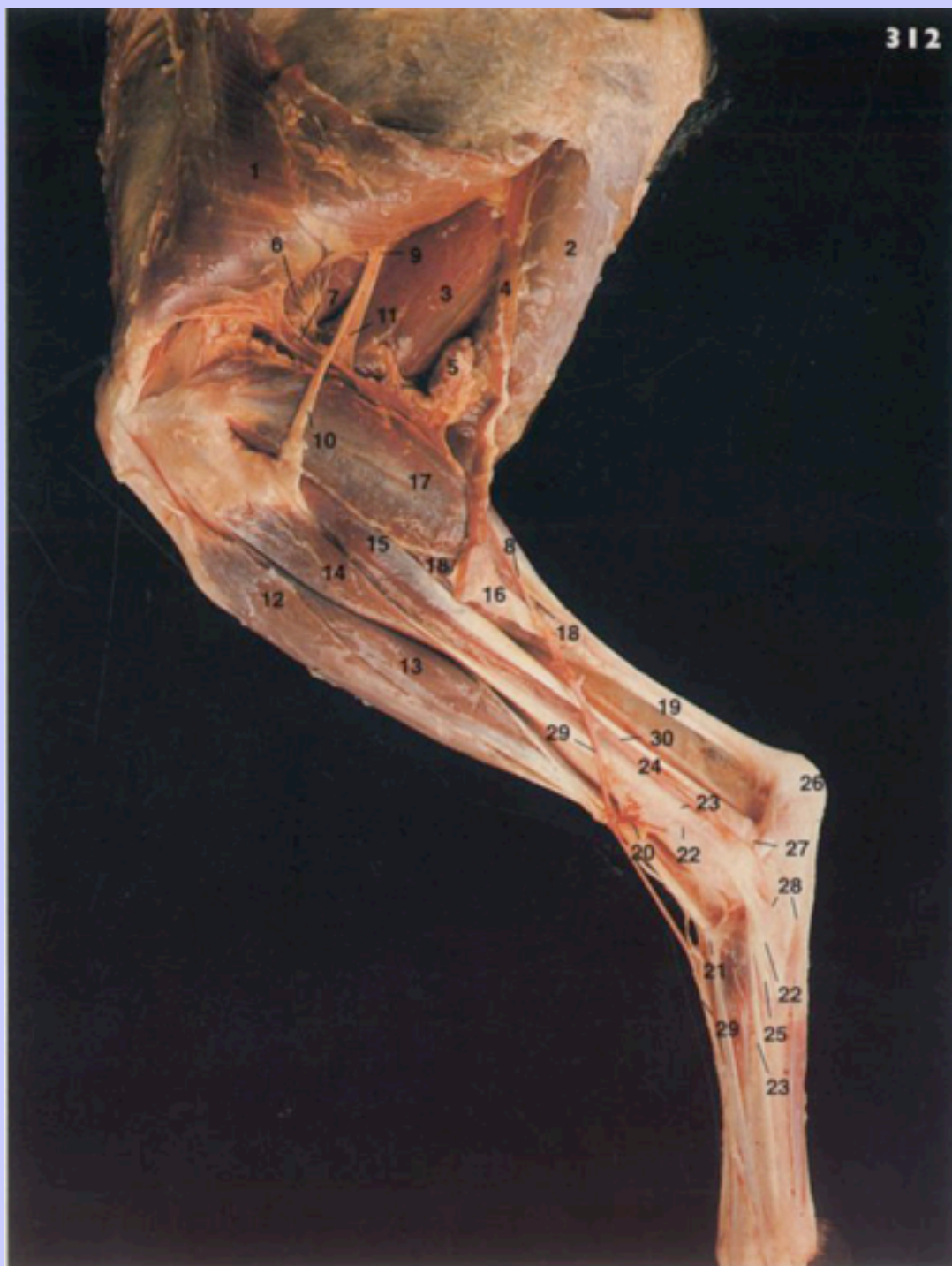
7.0.5

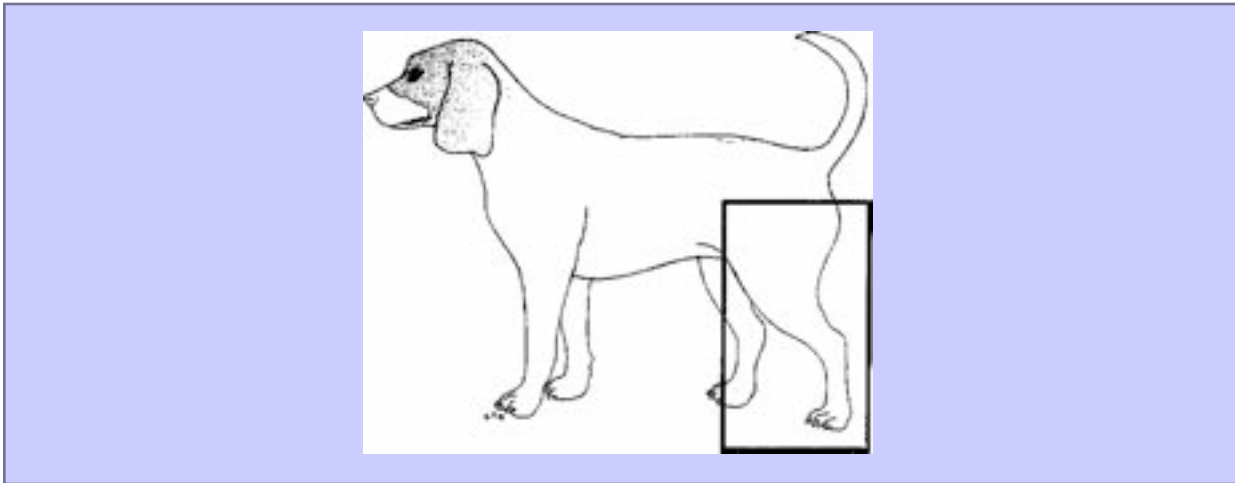
Clinical Note

13 & 14 Note that these muscles lie lateral to the rectum as it becomes confluent with the anal canal. In this position they provide lateral support to the rectum during straining movements involved in the function of defaecation, forming the pelvic diaphragm. Breakdown of this muscular support can allow the rectum to deviate laterally to develop a perineal hernia. Surgical repair may be attempted to rebuild the lateral support. This involves sutures tying the muscles **13 & 14** to the sacrotuberous ligament (**9**). This procedure must be approached with caution due to the close approximation of the ligament to the ischiatic nerve trunk (**10**). If the sutures incorporate the nerve then paralysis of the ischiatic nerve may ensue with loss of motor function to the majority of the muscles of the pelvic limb.

188

312 Lateral aspect of the left thigh, crus and tarsal region of a dog. The biceps femoris muscle has been reflected to reveal the division of the ischiatic nerve.





1 M. biceps femoris (reflected)	11 Tibial nerve	20 Proximal extensor retinaculum
2 M. semitendinosus	12 M. tibialis cranialis	21 Distal extensor retinaculum
3 M. semimembranosus	13 M. extensor digitorum longus	22 Tendon of 14
4 M. abductor cruris caudalis	14 M. peroneus longus	23 Tendon of M. extensor digitorum lateralis
5 Popliteal lymph node	15 M. flexor hallucis longus (lateral head of M. flexor digitorum profundus)	24 M. peroneus brevis
6 Femoral artery and vein	16 Tendons of 1 and 2	25 Tendon of 24
7 Caudal femoral artery and vein	17 M. gastrocnemius	26 Calcaneal tuberosity
8 Lateral saphenous vein	18 M. flexor digitorum superficialis	27 Short part } of lateral collateral ligament of tarsus
9 Ischiatic nerve	19 Tendo calcaneus communis (Achilles)	28 Long part }
10 Common peroneal (fibular) nerve		29 Cranial ramus } of lateral saphenous vein
		30 Caudal ramus }

Clinical Note

5 This node is palpable in the normal dog during clinical examination. Enlargement of this node could indicate infection within the pelvic limb of that side.

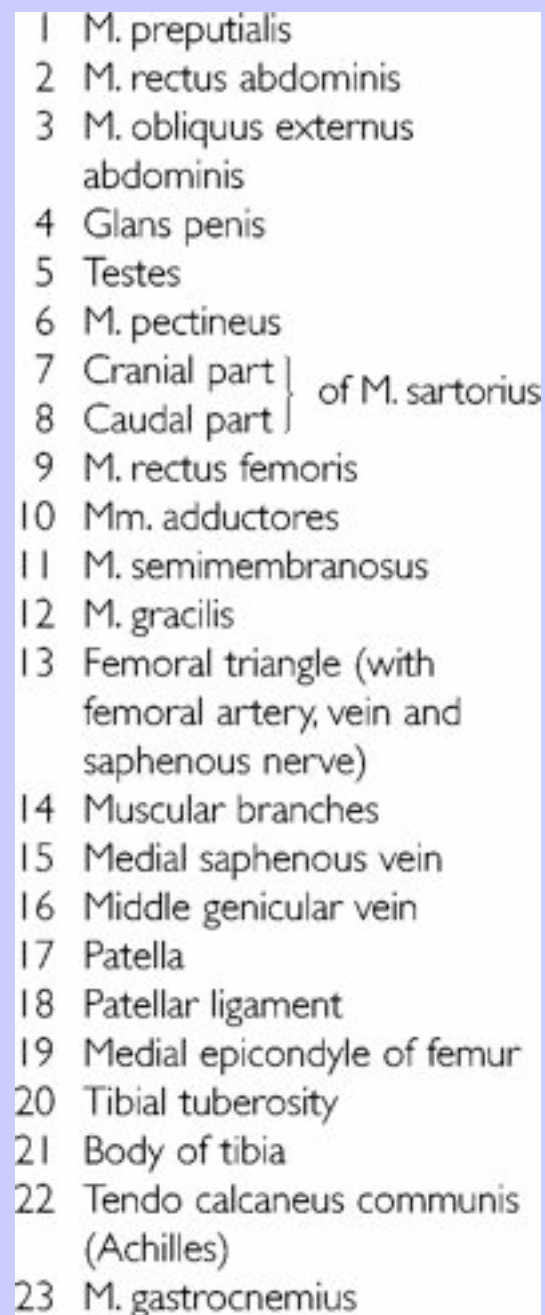
29 & 30 The lateral saphenous vein is used for venepuncture in the dog as it lies on the lateral crural region. The medial saphenous nerve can also be used – this is more often used in the cat.

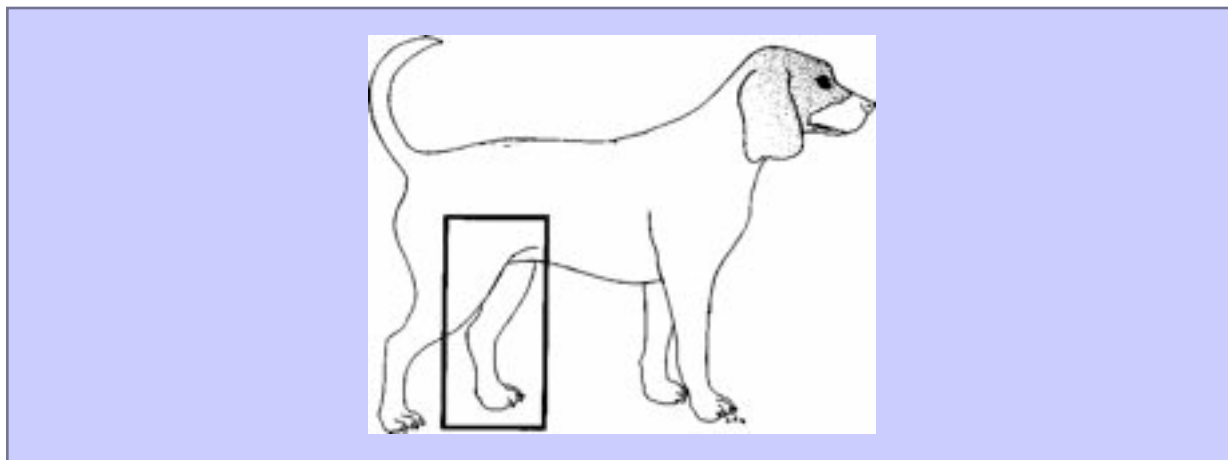
5 This node is palpable in the normal dog during clinical examination. Enlargement of this node could indicate infection within the pelvic limb of that side.

29 & 30 The lateral saphenous vein is used for venepuncture in the dog as it lies on the lateral crural region. The medial saphenous nerve can also be used – this is more often used in the cat.

313 Medial aspect of the thigh region of the left pelvic limb of a dog, showing the superficial muscles.



- 
- 1 M. preputialis
 - 2 M. rectus abdominis
 - 3 M. obliquus externus abdominis
 - 4 Glans penis
 - 5 Testes
 - 6 M. pectineus
 - 7 Cranial part } of M. sartorius
 - 8 Caudal part }
 - 9 M. rectus femoris
 - 10 Mm. adductores
 - 11 M. semimembranosus
 - 12 M. gracilis
 - 13 Femoral triangle (with femoral artery, vein and saphenous nerve)
 - 14 Muscular branches
 - 15 Medial saphenous vein
 - 16 Middle genicular vein
 - 17 Patella
 - 18 Patellar ligament
 - 19 Medial epicondyle of femur
 - 20 Tibial tuberosity
 - 21 Body of tibia
 - 22 Tendo calcaneus communis (Achilles)
 - 23 M. gastrocnemius



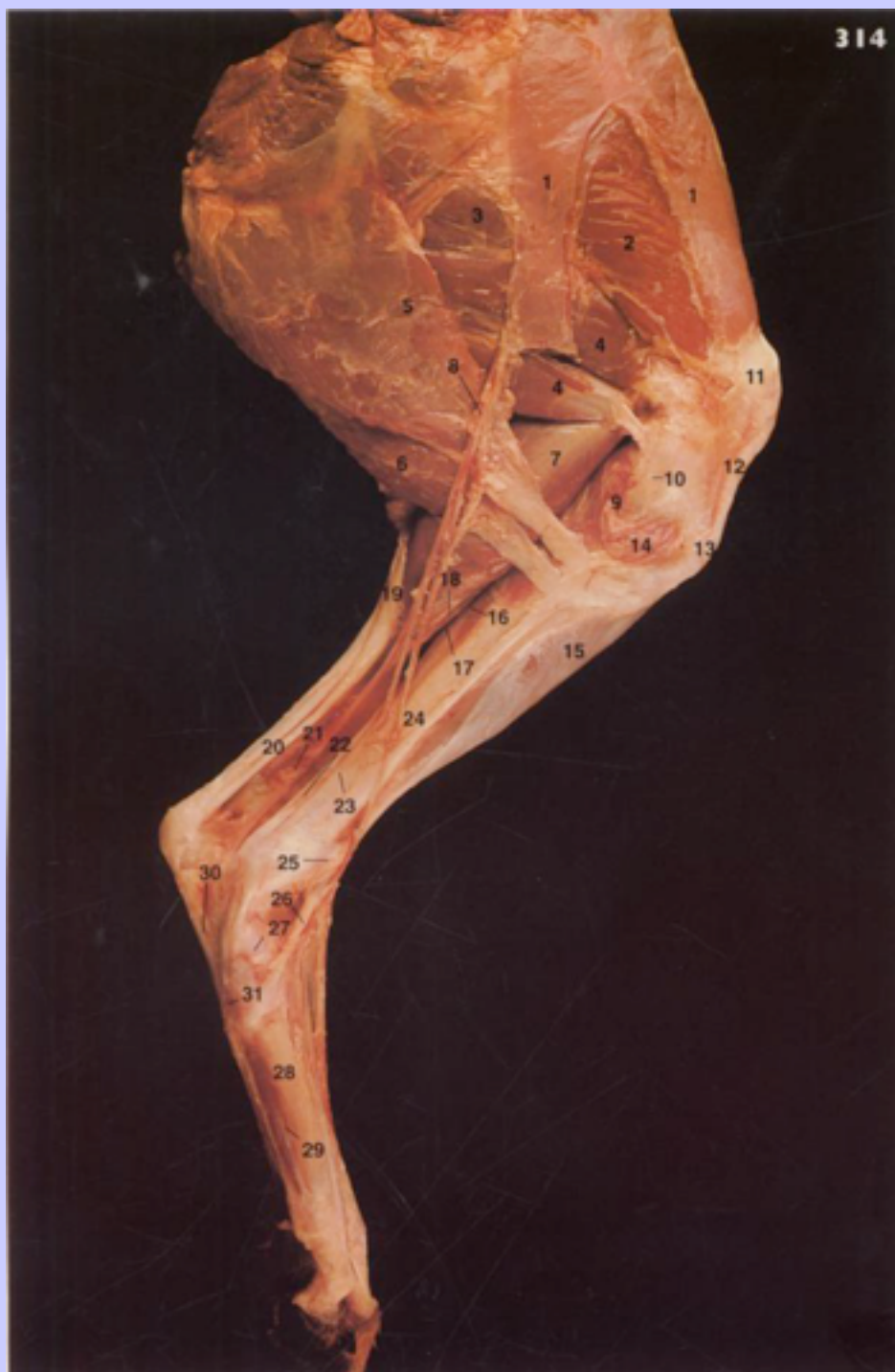
7.0.7

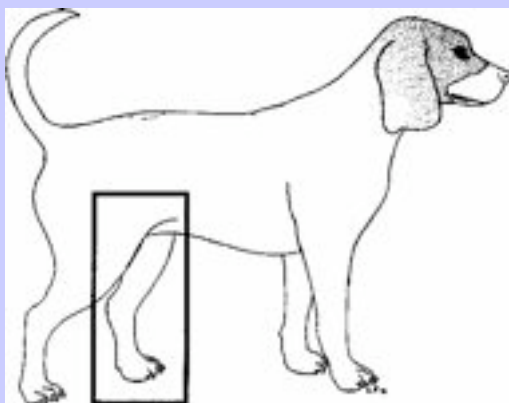
Clinical Note

- 13** It is in this position that the clinician places his fingers when taking the animal's pulse rate from the femoral artery. This is also a site for venepuncture in the anaesthetised dog when larger volumes of blood are required.

190

314 Medial aspect of the thigh region and crus of the left pelvic limb of a dog. The limb has been resected from its body attachments, and the caudal part of the sartorius muscle has been cut to reveal the deeper muscles.





- 1 M. sartorius
- 2 M. vastus medialis
- 3 M. adductor
- 4 M. semimembranosus
- 5 M. gracilis
- 6 M. semitendinosus
- 7 M. gastrocnemius
- 8 Saphenous artery, vein and nerve
- 9 M. popliteus
- 10 Medial collateral ligament of stifle
- 11 Patella
- 12 Patellar ligament
- 13 Tibial tuberosity
- 14 M. sartorius (cut end)
- 15 M. tibialis cranialis
- 16 M. flexor digitorum longus
- 17 M. flexor hallucis longus (lateral head of M. flexor digitorum profundus)
- 18 M. flexor digitorum superficialis

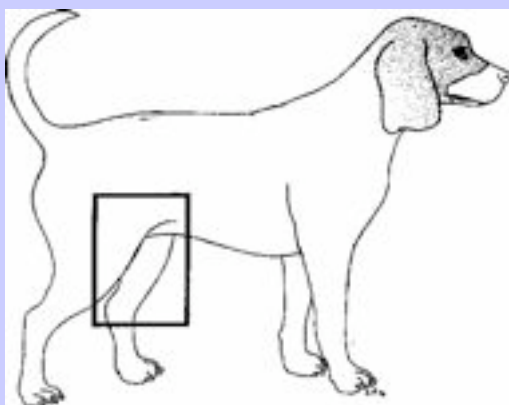
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- 19 Tendons of 6 and M. biceps femoris (cut end)
- 20 Tendo calcaneus communis (Achilles)
- 21 Saphenous artery (caudal branch)
- 22 Tendon of 17
- 23 Tendon of 16
- 24 Body of tibia
- 25 Proximal extensor retinaculum
- 26 Tendon of 15
- 27 Medial collateral ligament of tarsus
- 28 Second metatarsal bone
- 29 Mm. interossei
- 30 Tendon of 18
- 31 Tendon of M. flexor digitorum profundus

191

315 Medial aspect of the thigh region of the left pelvic limb of a dog. The gracilis and sartorius muscles have been resected.





- 1 Glans penis
- 2 External preputial orifice
- 3 Testis within parietal layer of vaginal tunic
- 4 Spermatic cord
- 5 Superficial (external) inguinal ring
- 6 M. obliquus externus abdominis
- 7 Body of penis
- 8 Ischiatic tuberosity
- 9 M. semitendinosus
- 10 M. semimembranosus
- 11 Mm. adductor magnus and brevis
- 12 M. pectineus
- 13 M. vastus medialis
- 14 M. rectus femoris
- 15 M. tensor fasciae latae
- 16 Fascia lata
- 17 Patella
- 18 Patellar ligament

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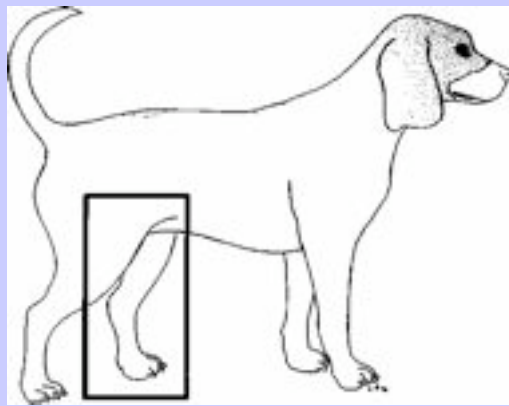
- 19 Tibial tuberosity
- 20 Body of tibia
- 21 Medial saphenous artery and vein
- 22 Tendo calcaneus communis (Achilles)
- 23 M. gastrocnemius
- 24 M. popliteus
- 25 Middle genicular vein
- 26 Medial epicondyle of femur
- 27 Femoral triangle
- 28 Femoral artery and vein
- 29 Saphenous nerve (from femoral nerve)
- 30 Middle caudal femoral artery and vein
- 31 Branch of femoral nerve to 15 and M. sartorius
- 32 Branch of obturator nerve to M. pectineus and M. adductor

192

316 Medial aspect of the left crus of a dog.

193

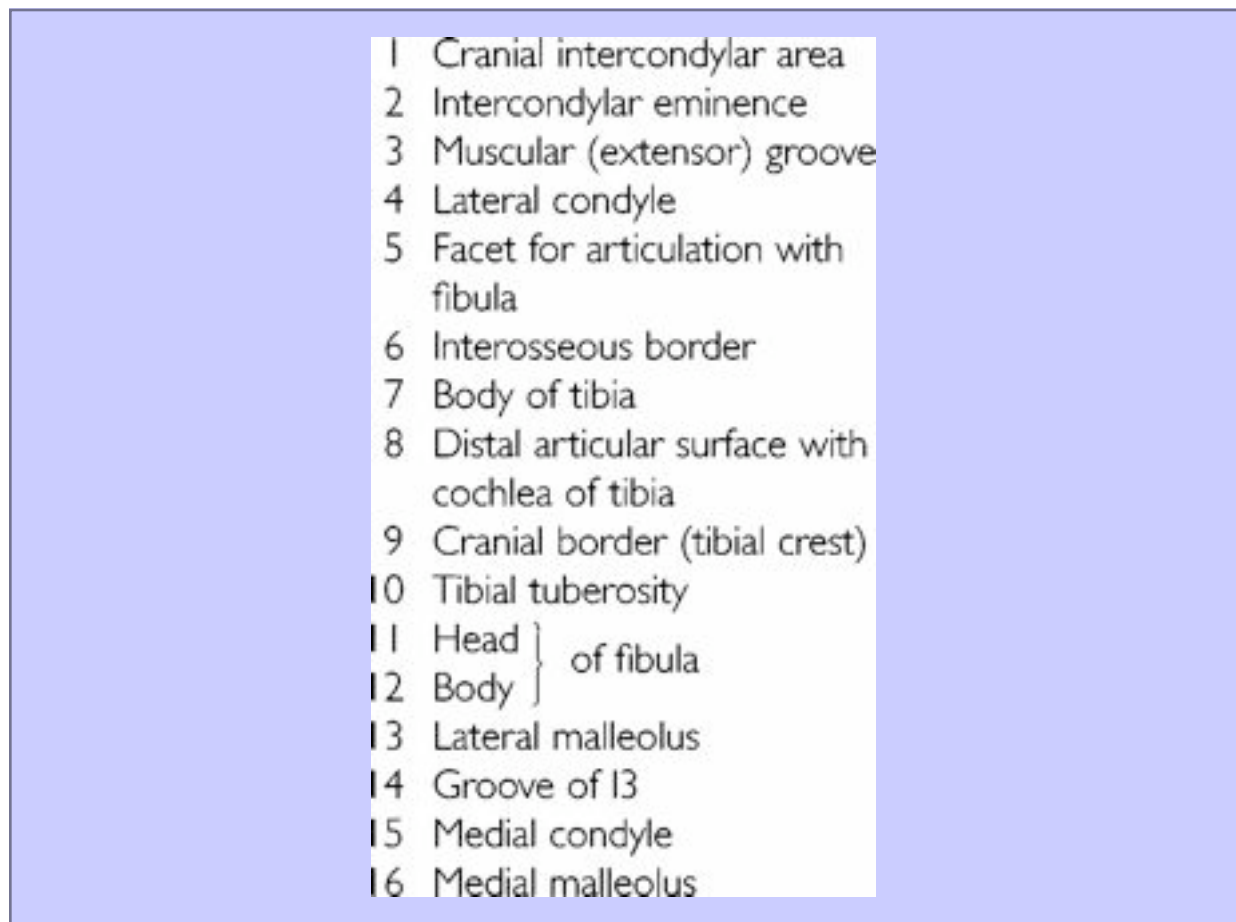




- 1 M. semitendinosus
- 2 M. gastrocnemius
- 3 M. popliteus
- 4 Tendons of M. biceps femoris and 1 (cut end)
- 5 Saphenous artery and vein
- 6 M. flexor hallucis longus
- 7 M. flexor digitorum longus (medial head of M. flexor digitorum profundus)
- 8 Tendon of M. flexor hallucis longus (lateral head of M. flexor digitorum profundus)
- 9 M. tibialis cranialis
- 10 Body of tibia
- 11 Proximal extensor retinaculum
- 12 Tendo calcaneus communis (Achilles)
- 13 Calcaneal tuberosity
- 14 Tendon of M. tibialis caudalis
- 15 Medial collateral ligament
- 16 Tendon of M. flexor digitorum superficialis
- 17 Tendon of M. flexor digitorum profundus
- 18 Mm. interossei

317 Lateral aspect of the left tibia and fibula (A) and medial aspect of the right tibia and fibula (B) of a dog.





194

318 Lateral aspect of the left tibia and fibula (A) and medial aspect of the right tibia and fibula (B) of a dog, showing the centres of ossification.



- 1 Body of tibia
- 2 Proximal tibia
- 3 Tibial tuberosity

- 4 Distal tibia
- 5 Body of fibula
- 6 Proximal fibula
- 7 Distal fibula

319 Lateral aspect of the left tibia and fibula (A) and medial aspect of the right tibia and fibula (B) of a cat.



- | | |
|--|--|
| 1 Intercondylar eminence | 9 Distal articular surface |
| 2 Lateral condyle of tibia | 10 Head } of fibula |
| 3 Facet for proximal articulation
with fibula | 11 Body } |
| 4 Muscular groove | 12 Lateral malleolus |
| 5 Tibial tuberosity | 13 Medial condyle of tibia |
| 6 Cranial border (tibial crest) | 14 Medial malleolus |
| 7 Body of tibia | 15 Facet for proximal articulation
with tibia |
| 8 Facet for distal articulation
with fibula | 16 Facet for distal articulation
with tibia |

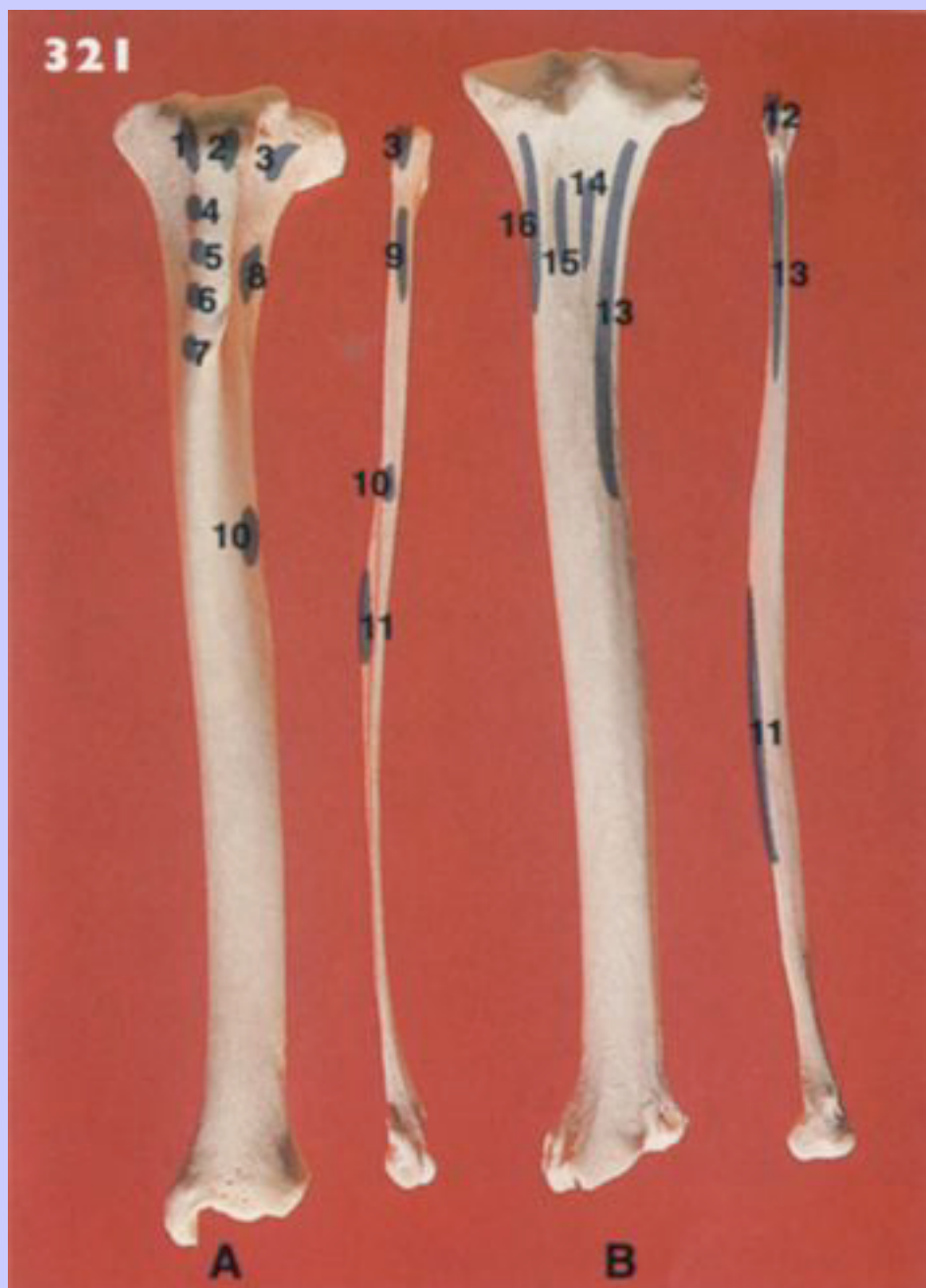
195

320 Cranial aspect of the left tibia and fibula (A) and caudal aspect of the right tibia and fibula (B) of a dog.



- 1 Medial condyle
- 2 Cranial intercondylar area
- 3 Medial and lateral intercondylar tubercles
- 4 Muscular (extensor) groove
- 5 Lateral condyle
- 6 Tibial tuberosity
- 7 Cranial border (tibial crest)
- 8 Facies articularis fibularis
- 9 Body of tibia
- 10 Interosseous border
- 11 Medial malleolus
- 12 Head of fibula
- 13 Facet for proximal articulation with fibula
- 14 Body of fibula
- 15 Lateral malleolus
- 16 Facies articulares malleoli
- 17 Groove of lateral malleolus (sulcus malleolaris lateralis)
- 18 Intercondylar eminence
- 19 Caudal intercondylar area
- 20 Popliteal notch
- 21 Facet for articulation of sesamoid in tendon M. popliteus
- 22 Distal articular surface with cochlea of tibia

321 Cranial aspect of the left tibia and fibula (A) and caudal aspect of the right tibia and fibula (B) of a dog, showing areas of muscle attachment.



1 Biceps femoris

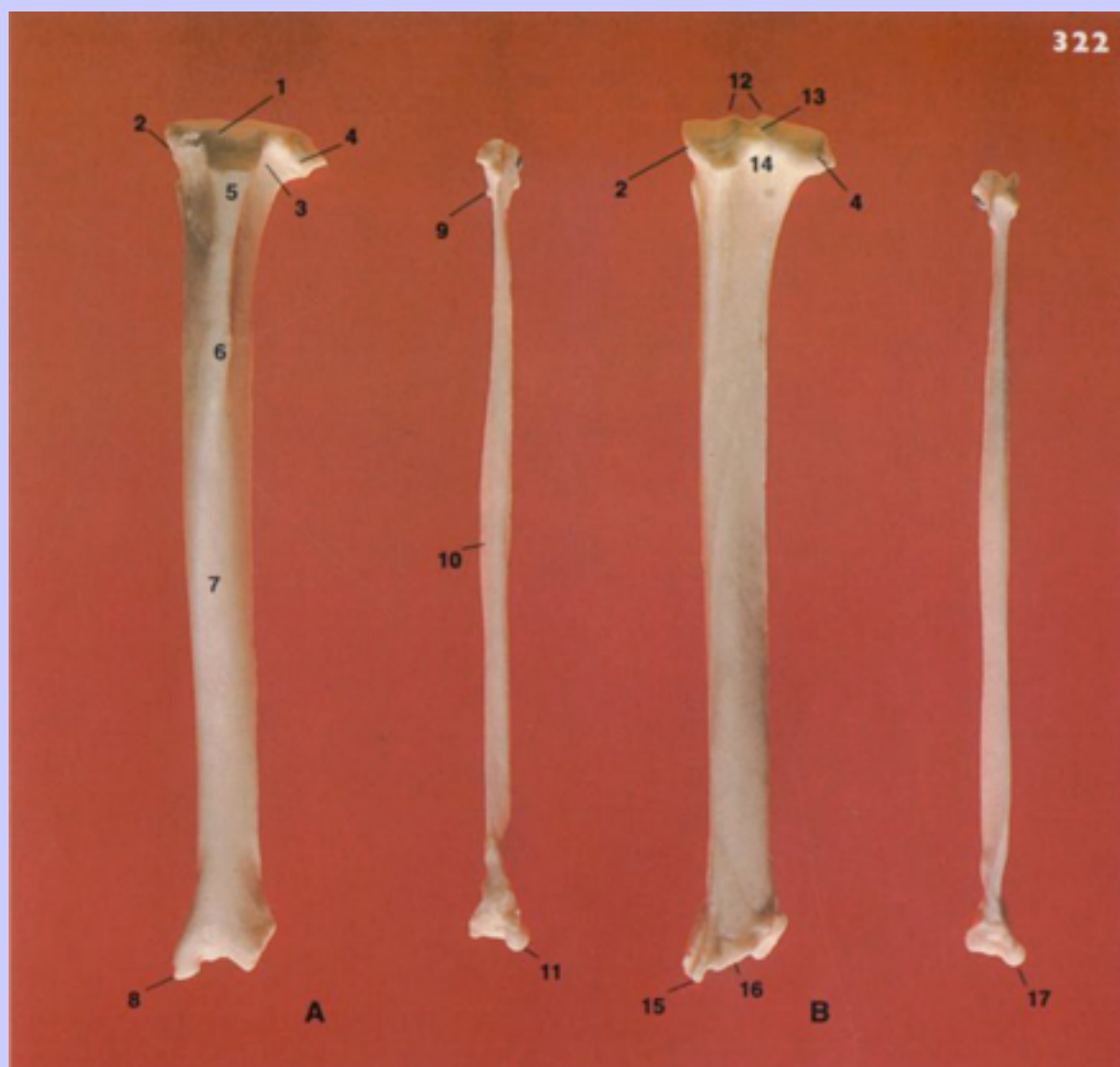
2 Cranial tibial

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- 3 Peroneus longus
- 4 Quadriceps femoris
- 5 Sartorius
- 6 Gracilis
- 7 Semitendinosus
- 8 Flexor hallucis longus (radial)
- 9 Extensor digitorum lateralis
- 10 Extensor hallucis longus (ulnar)
- 11 Peroneus brevis
- 12 Caudal tibial (ulnar)
- 13 Flexor hallucis longus (lateral head of M. flexor digitorum profundus)
- 14 Caudal tibial (tibial)
- 15 Flexor digitorum longus (medial head of M. flexor digitorum profundus)
- 16 Popliteus

196

322 Cranial aspect of the left tibia and fibula (A) and caudal aspect of the right tibia and fibula (B) of a cat.



- | | | |
|------------------------------|---------------------------|--------------------------------|
| 1 Cranial intercondylar area | 7 Body of tibia | 13 Caudal intercondylar area |
| 2 Medial condyle | 8 Medial malleolus | 14 Popliteal notch |
| 3 Muscular groove | 9 Head of fibula | 15 Medial malleolus of tibia |
| 4 Lateral condyle | 10 Body of fibula | 16 Distal articular surface |
| 5 Tibial tuberosity | 11 Lateral malleolus | 17 Lateral malleolus of fibula |
| 6 Cranial border | 12 Intercondylar eminence | |

This anatomical illustration shows the right elbow joint in two views: A (anterior) and B (posterior). The humerus (1) is at the top, and the radius (2) and ulna (3) are below it. The joint is surrounded by ligaments and muscles. Labels 1-26 identify various structures. In view A, the anterior view, the radius is on the left and the ulna is on the right. In view B, the posterior view, the radius is on the right and the ulna is on the left. The joint is shown in a flexed position. Labels 'a', 'b', 'c', and 'd' indicate specific regions or structures. The illustration is set against a red background.

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a Stifle joint	8 Lateral condyle of femur	19 Medial supracondylar tuberosity
b Femoropatellar joint	9 Tibial tuberosity	20 Medial epicondyle
c Femorotibial joint	10 Cranial border (tibial crest)	21 Medial fabella (M. gastrocnemius)
d Proximal tibiofibular joint	11 Muscular (extensor) groove	22 Medial condyle of femur
1 Body of femur	12 Lateral condyle of tibia	23 Tibial crest
2 Patella	13 Proximal tibiofibular joint	24 Cranial border
3 Lateral supracondylar tuberosity	14 Head } of fibula	25 Medial condyle of tibia
4 Lateral ridge of trochlea	15 Body }	26 Sesamoid in tendon of M. popliteus
5 Lateral epicondyle	16 Interosseous space	
6 Lateral fabella } (in origin of M. gastrocnemius)	17 Body of tibia	
7 Medial fabella }	18 Medial ridge of trochlea	

198

324 Lateral aspect of the left stifle joint of a dog. The skin and fascia surrounding the joint have been removed.



- 1 M. vastus medialis
- 2 M. semimembranosus
- 3 M. gastrocnemius
- 4 Patella
- 5 Patellar ligament
- 6 Lateral ridge of trochlea
- 7 Lateral femoropatellar ligament
- 8 Site of sesamoid (fabella) in tendon of 3
- 9 Lateral collateral ligament
- 10 Fibula
- 11 M. extensor digitorum longus
- 12 Tendon of origin of 11
- 13 Tibial tuberosity
- 14 M. tibialis cranialis

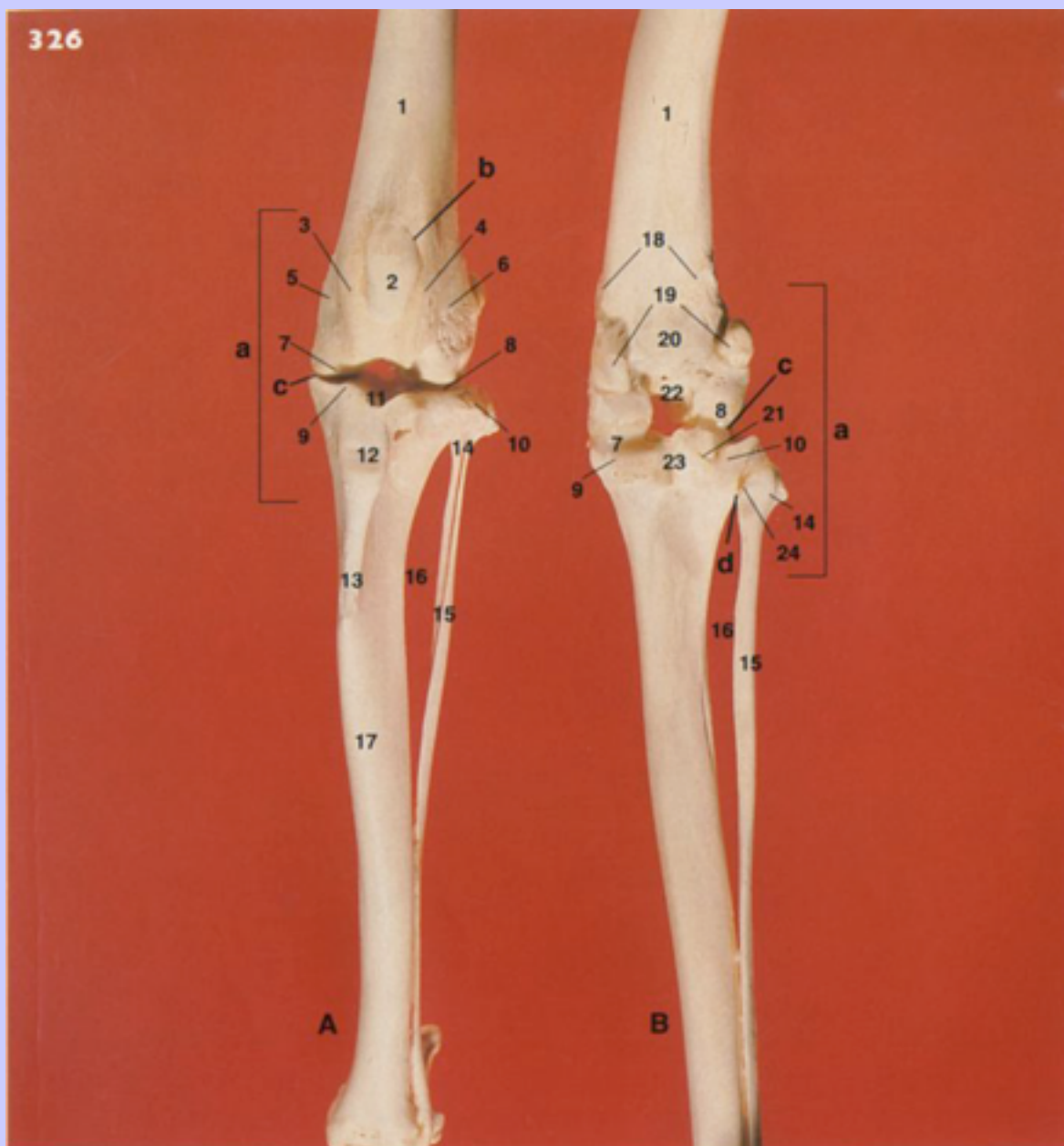
325 Medial aspect of the left stifle joint of a dog. The skin and fascia surrounding the joint have been removed.



- 1 M. sartorius
- 2 M. vastus medialis
- 3 M. semimembranosus
- 4 M. gastrocnemius
- 5 M. popliteus
- 6 Patella
- 7 Patellar ligament
- 8 Tibial tuberosity
- 9 Cranial border (tibial crest)
- 10 Medial collateral ligament
- 11 Medial meniscus
- 12 Medial condyle of femur
- 13 Site of sesamoid (fabella) in tendon of 4
- 14 Cut edge of femoropatellar ligament
- 15 Medial ridge of trochlea

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326 Cranial aspect of the left stifle joint (A) and caudal aspect of the right stifle joint (B) of a dog.



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a Stifle joint	7 Medial condyle	} of femur	18 Medial and lateral supracondylar tuberosities
b Femoropatellar joint	8 Lateral condyle		
c Femorotibial joint	9 Medial condyle	} of tibia	19 Medial and lateral fabellae (in origin of M. gastrocnemius)
d Proximal tibiofibular joint	10 Lateral condyle		
1 Body of femur	11 Intercondylar area		20 Popliteal surface
2 Patella	12 Tibial tuberosity		21 Sesamoid in tendon of M. popliteus
3 Medial ridge } of trochlea	13 Cranial border (tibial crest)		22 Intercondylar fossa of femur
4 Lateral ridge }	14 Head }	} of fibula	23 Caudal intercondylar area
5 Medial epicondyle }	15 Body }		24 Proximal tibiofibular joint
6 Lateral epicondyle }	16 Interosseous space		
	17 Body of tibia		

200

201

327 Cranial aspect of the left stifle joint of a dog. The skin and fascia surrounding the joint have been removed.



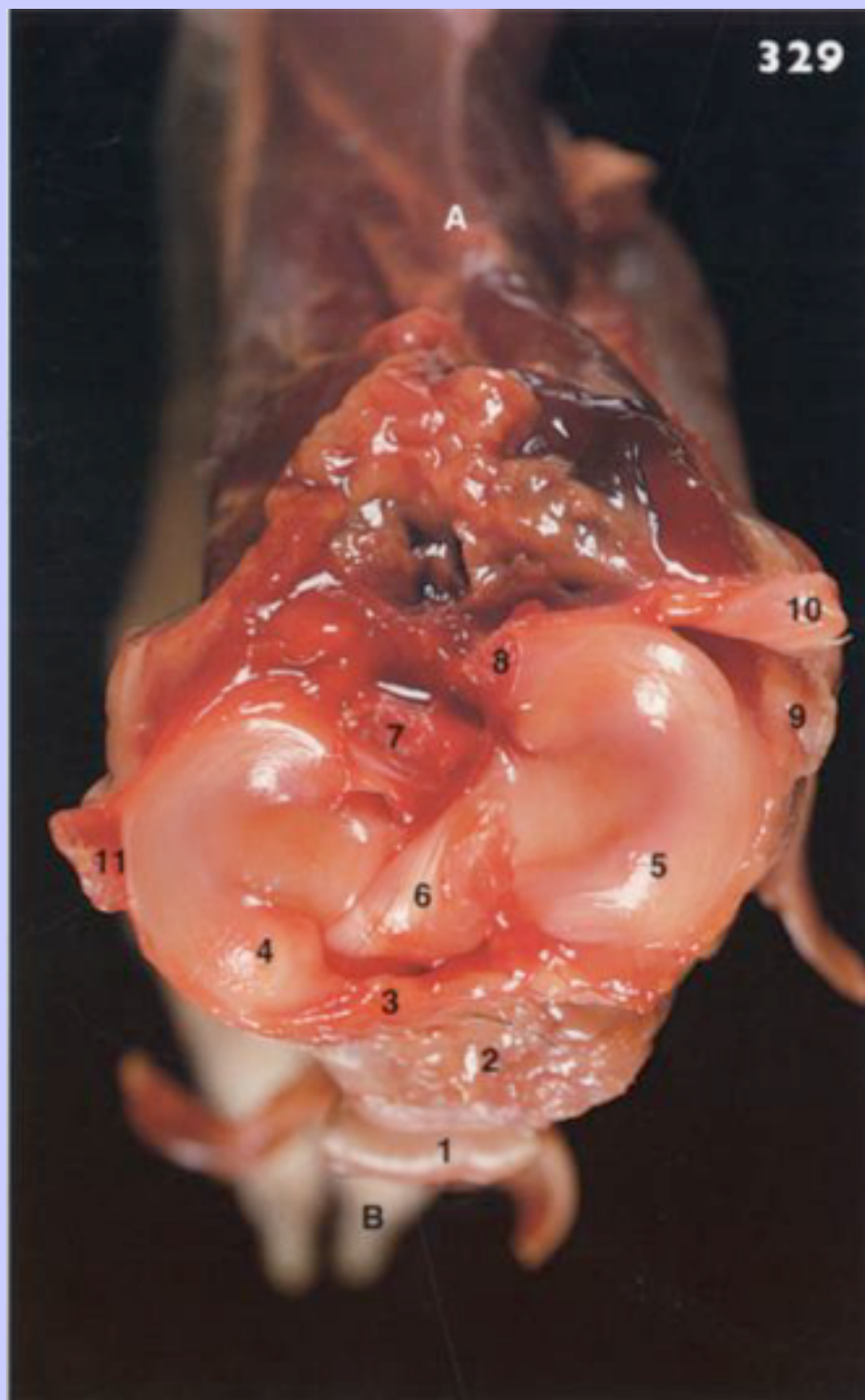
- 1 M. sartorius
- 2 M. vastus medialis
- 3 M. vastus lateralis
- 4 Patella
- 5 Patellar ligament
- 6 Tibial tuberosity
- 7 Cranial border (tibial crest)
- 8 M. tibialis cranialis
- 9 Fibula
- 10 Lateral collateral ligament
- 11 Tendon of M. extensor digitorum longus
- 12 Medial collateral ligament
- 13 Medial meniscus
- 14 Lateral meniscus
- 15 Medial ridge of trochlea
- 16 Lateral ridge of trochlea

328 Cranial aspect of the left stifle joint of a dog. The patella has been displaced from the trochlea of the femur and retracted distally. The joint has been placed in extreme flexion and the joint capsule opened to reveal the intracapsular structures.



- 1 Cut joint capsule
- 2 Sectioned M. quadriceps femoris
- 3 Medial ridge of trochlea
- 4 Lateral ridge of trochlea
- 5 Trochlea
- 6 Medial condyle of femur
- 7 Lateral condyle of femur
- 8 Cranial cruciate ligament
- 9 Caudal cruciate ligament
- 10 Medial meniscus
- 11 Lateral meniscus
- 12 Medial collateral ligament.
- 13 Lateral collateral ligament
- 14 Tendon of M. extensor digitorum longus
- 15 Infrapatellar fat body
- 16 Medial condyle of tibia
- 17 Tibial tuberosity
- 18 Patellar ligament (reflected)

329 The left stifle joint of a dog after removal of the femur to reveal the articular surface of the proximal extremity of the tibia. The collateral ligaments, the cruciate ligaments and the joint capsule have been transected.

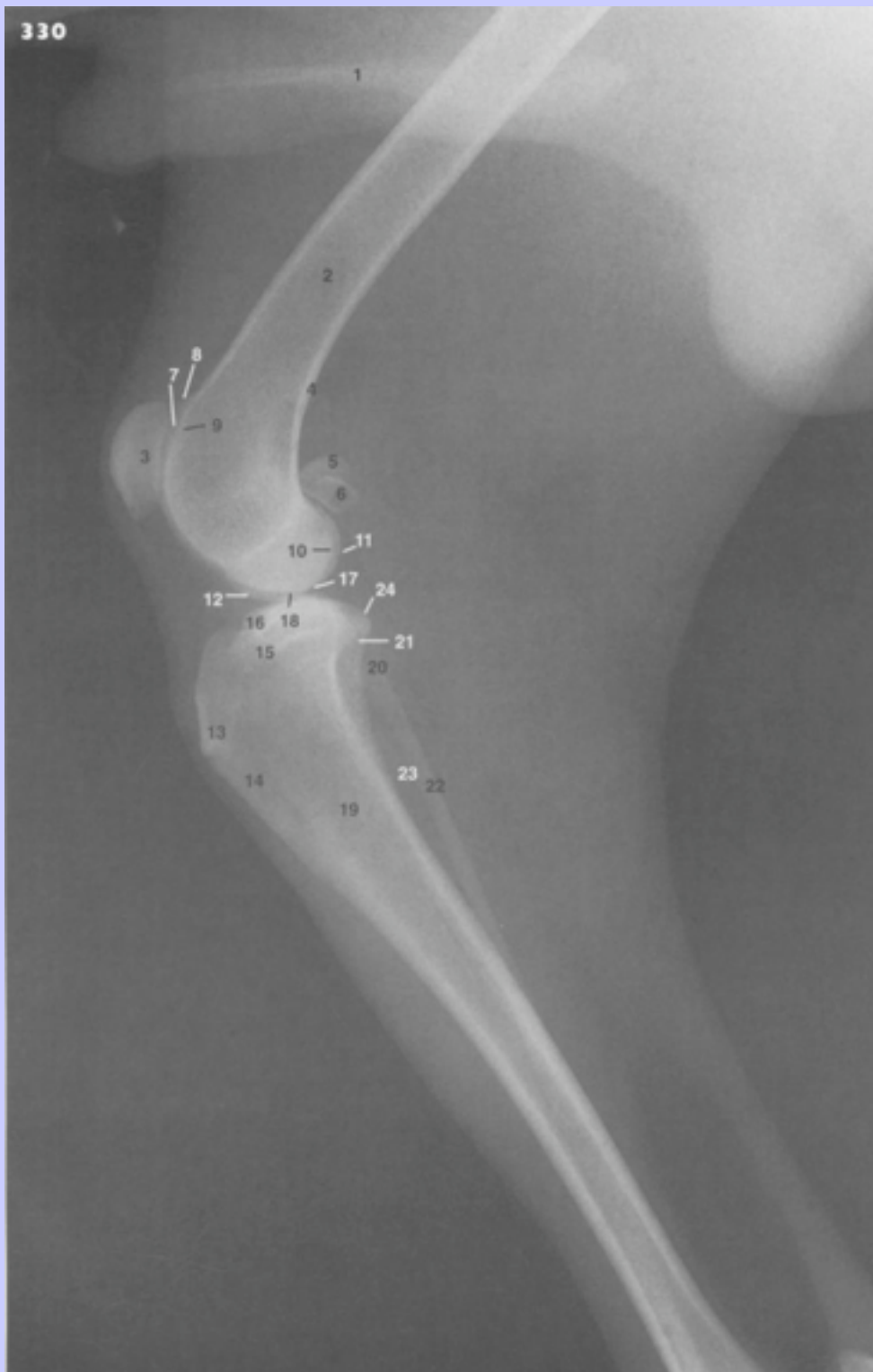


- A Caudal
- B Cranial
- 1 Patellar ligament reflected
- 2 Infrapatellar fat body
- 3 Transverse ligament
- 4 Medial meniscus
- 5 Lateral meniscus
- 6 Cranial cruciate ligament (cut)
- 7 Caudal cruciate ligament (cut)
- 8 Meniscomfemoral ligament (cut)
- 9 Tendon of M. extensor digitorum longus (cut)
- 10 Lateral collateral ligament (cut)
- 11 Medial collateral ligament (cut)

201

330 Mediolateral radiograph of the stifle joint of a dog.

202




- 
- 1 Os penis
 - 2 Body of femur
 - 3 Patella
 - 4 Lateral supracondylar tuberosity
 - 5 Lateral fabella } (in origin of
 - 6 Medial fabella } M. gastrocnemius)
 - 7 Femoropatellar joint
 - 8 Lateral ridge } of trochlea
 - 9 Medial ridge }
 - 10 Lateral condyle } of femur
 - 11 Medial condyle }
 - 12 Femorotibial joint
 - 13 Tibial tuberosity
 - 14 Cranial border (tibial crest)
 - 15 Lateral condyle } of tibia
 - 16 Medial condyle }
 - 17 Lateral intercondylar tubercle
 - 18 Medial intercondylar tubercle
 - 19 Body of tibia
 - 20 Head of fibula
 - 21 Proximal tibiofibular joint
 - 22 Body of fibula
 - 23 Interosseous space
 - 24 Fabella in the tendon of M. popliteus

331 Craniocaudal radiograph of the stifle joint of a dog.

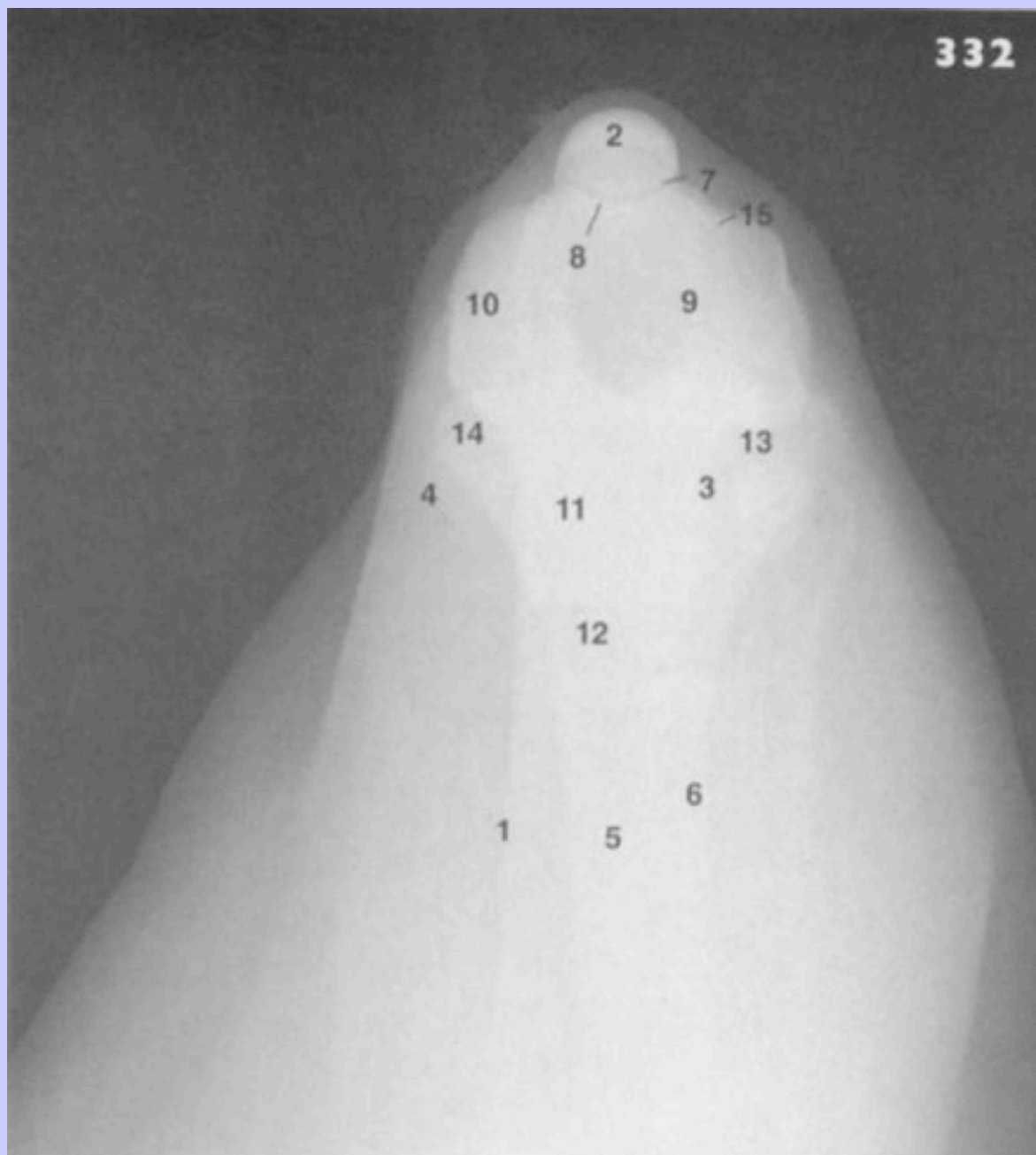
203





- 
- 1 Body of femur
2 Patella
3 Lateral fabella } (in origin of
4 Medial fabella } M. gastrocnemius)
5 Lateral ridge } of trochlea
6 Medial ridge }
7 Lateral condyle } of femur
8 Medial condyle }
9 Femorotibial joint space
10 Intercondylar fossa
11 Lateral intercondylar tubercle
12 Medial intercondylar tubercle
13 Intercondylar area
14 Lateral condyle } of tibia
15 Medial condyle }
16 Fabella in tendon of M. popliteus
17 Tibial tuberosity
18 Base of tibial crest
19 Head of fibula
20 Proximal tibiofibular joint
21 Interosseous space
22 Body of fibula
23 Body of tibia

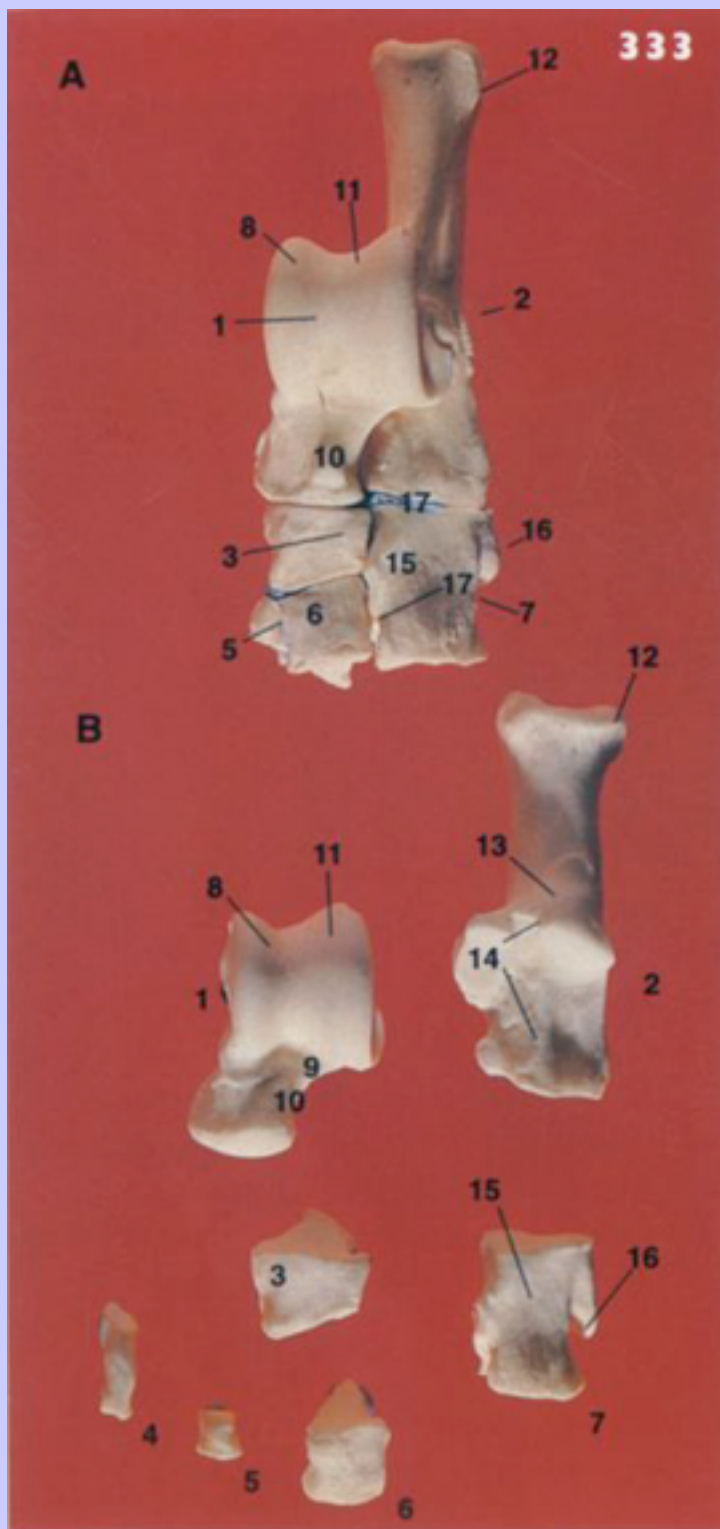
332 Radiograph of the flexed stifle joint of a dog.




- 
- 1 Body of femur
2 Patella
3 Lateral fabella } (in origin of
4 Medial fabella } M. gastrocnemius)
5 Body of tibia
6 Body of fibula
7 Femoropatellar joint
8 Trochlear groove
9 Lateral condyle } of femur
10 Medial condyle }
11 Tibial tuberosity
12 Cranial border (tibial crest)
13 Lateral condyle } of tibia
14 Medial condyle }
15 Extensor fossa

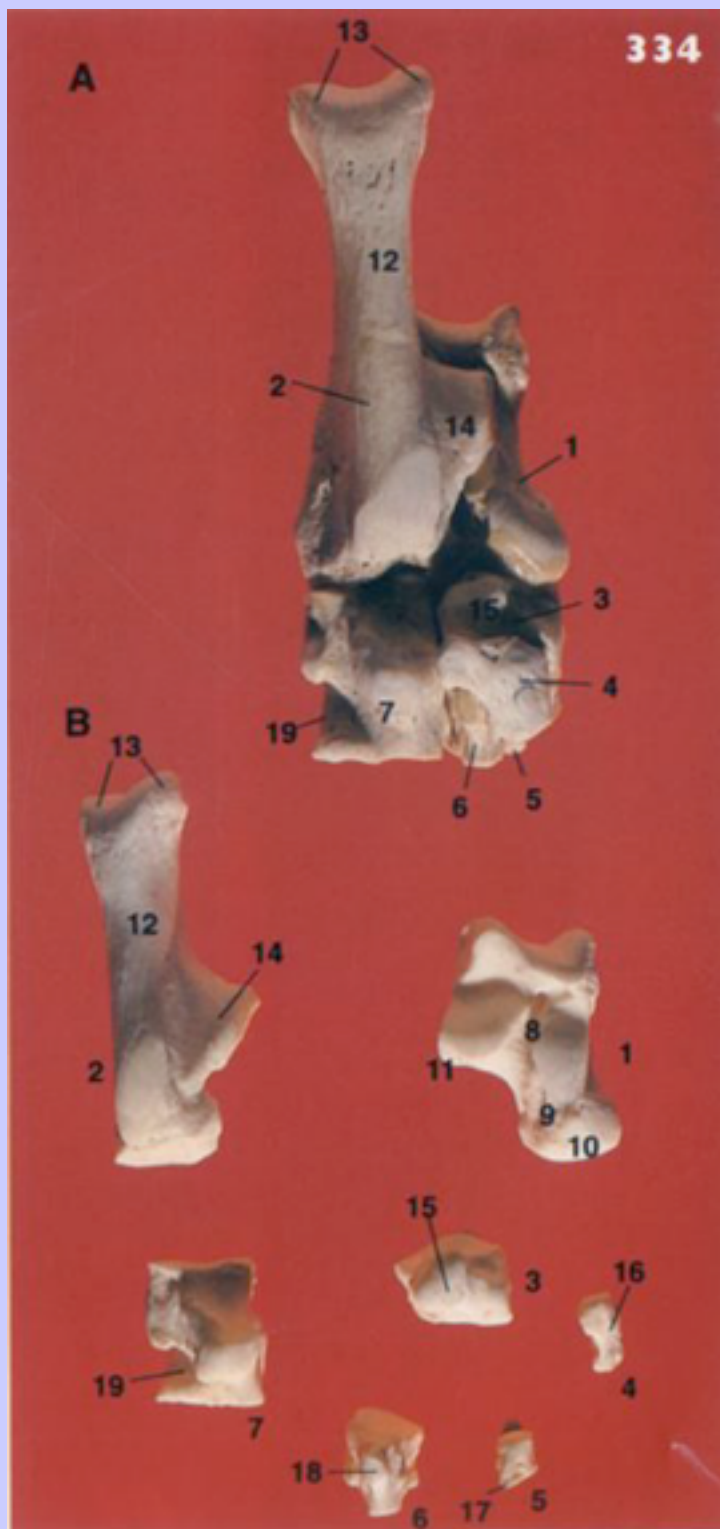
203


333 Dorsal aspect of the articulated (A) and separated (B) left tarsus of a dog.



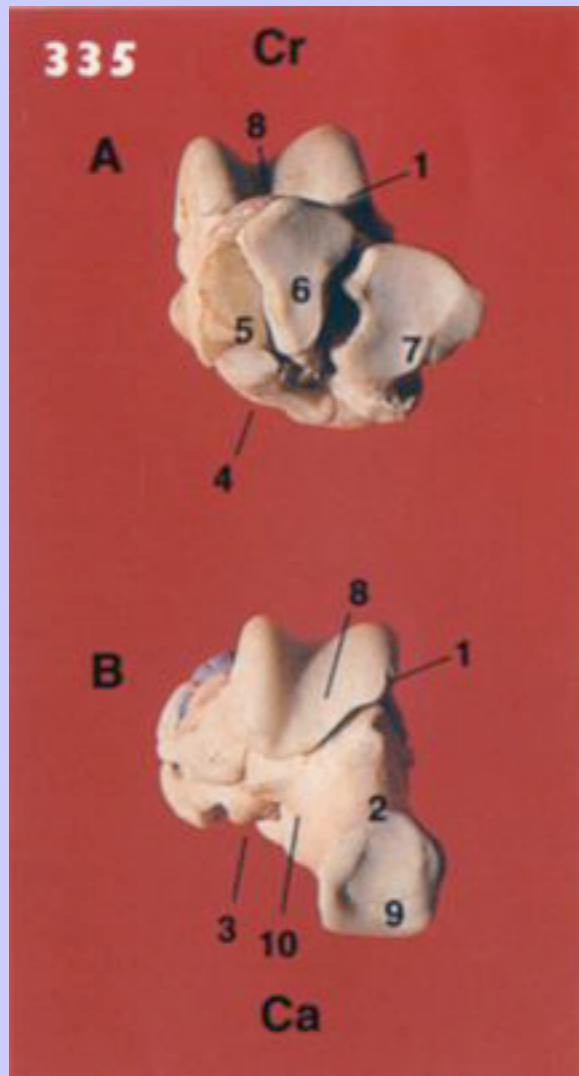
- 
- 1 Talus
2 Calcaneus
3 Central
4 First
5 Second
6 Third
7 Fourth } tarsal bone
8 Body
9 Neck
10 Head } of talus
11 Trochlea
12 Calcaneal tuberosity
13 Sustentaculum tali
14 Articular surface for talus
15 Medial process of fourth tarsal bone
16 Sulcus for tendon of M. fibularis longus
17 Intratarsal joints

334 Plantar aspect of the articulated (A) and separated (B) left tarsus of a dog.



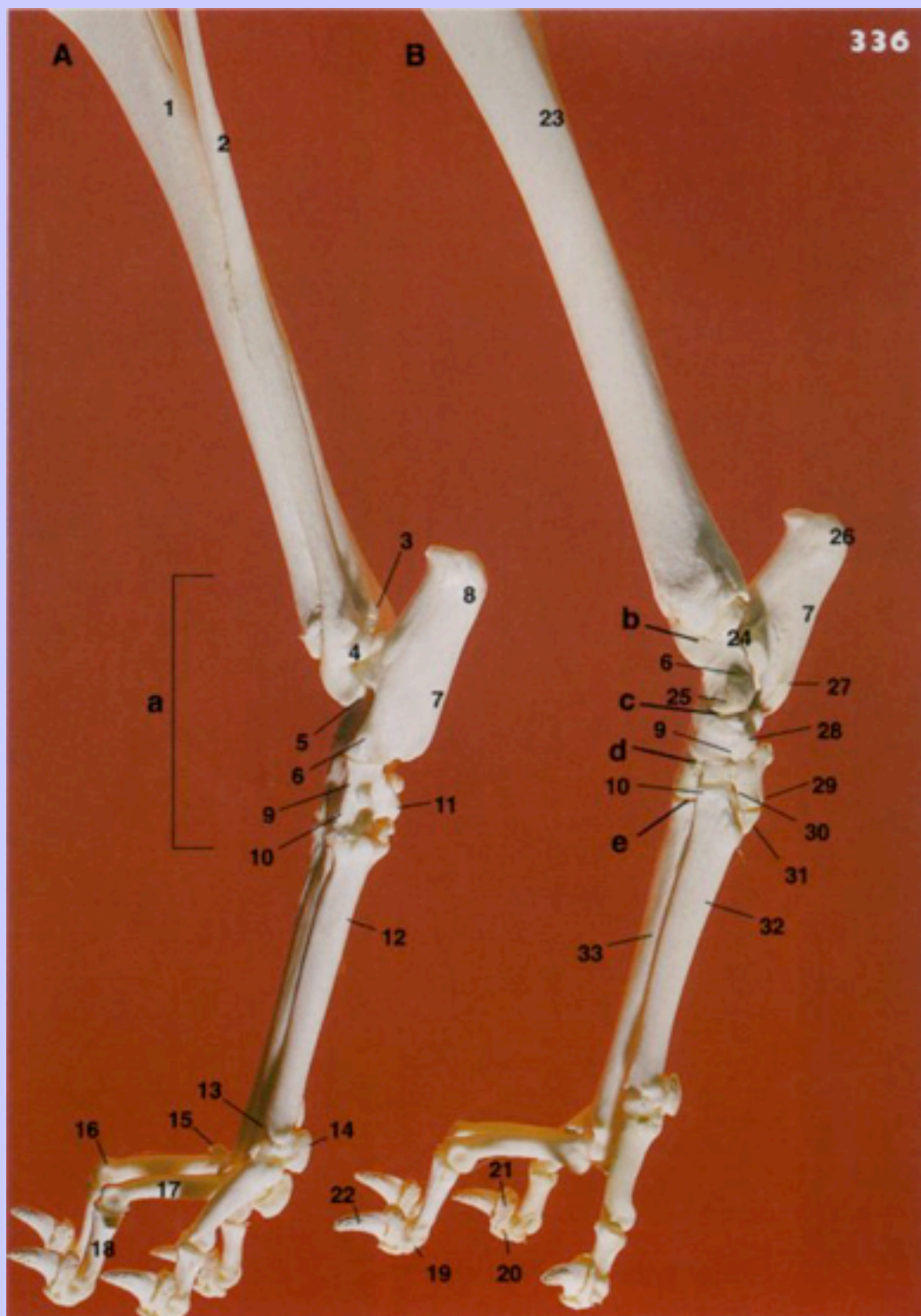
- 
- 1 Talus
 - 2 Calcaneus
 - 3 Central
 - 4 First
 - 5 Second
 - 6 Third
 - 7 Fourth
 - 8 Body
 - 9 Neck
 - 10 Head
 - 11 Lateral process
 - 12 Calcaneal tuberosity
 - 13 Lateral and medial processes of 12
 - 14 Sustentaculum tali
 - 15 Plantar process of 3
 - 16 Plantar process of 4
 - 17 Plantar process of 5
 - 18 Plantar process of 6
 - 19 Sulcus for tendon of M. fibularis longus

335 Distal aspect of the left tarsus (A) and proximal aspect of the right tarsus (B) of a dog. Cranial (Cr) and caudal (Ca) orientations are indicated.



- 1 Talus
 - 2 Calcaneus
 - 3 Central
 - 4 First
 - 5 Second
 - 6 Third
 - 7 Fourth
 - 8 Proximal trochlea
 - 9 Calcaneal tuberosity
 - 10 Sustentaculum tali
- } tarsal bone

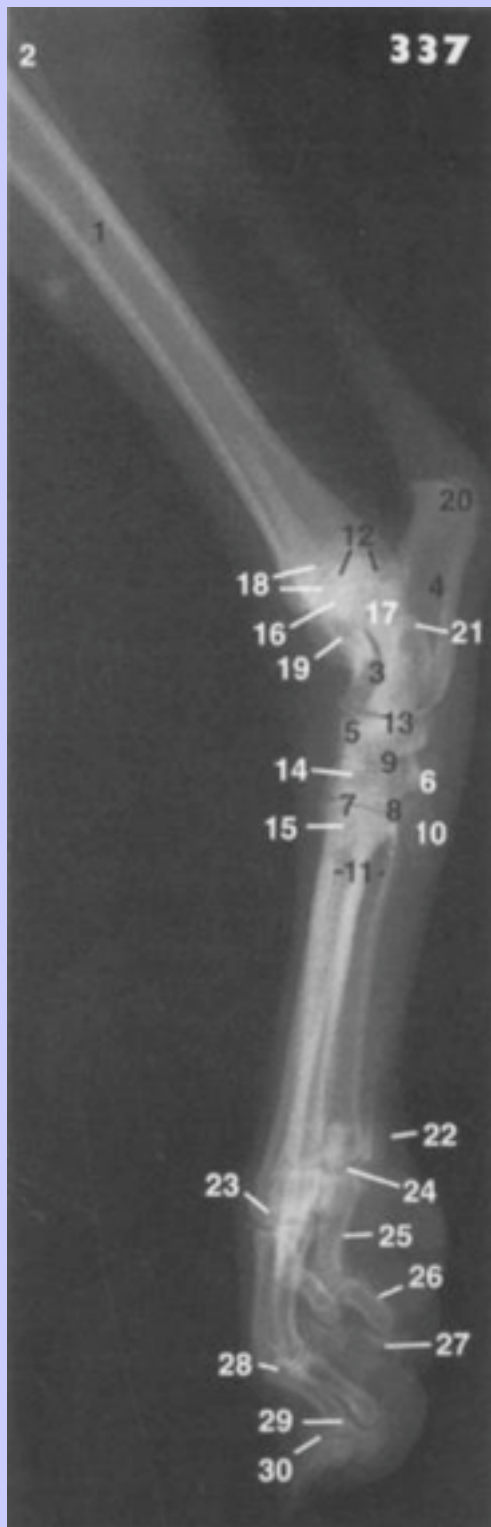
336 Lateral aspect of the left tarsus and pes (A) and medial aspect of the right tarsus and pes (B) of a dog.



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a Tarsal joints	9 Central	20 Distal phalanx
b Talocrural joint	10 Third	21 Ungual crest
c Proximal intertarsal joint	11 Fourth	22 Ungual process
d Distal intertarsal joint	12 Fifth metatarsal bone	23 Tibia
e Tarsometatarsal joints	13 Metatarsophalangeal joint	24 Medial malleolus
1 Body of tibia	14 Proximal sesamoids (plantar)	25 Neck of talus
2 Body of fibula	15 Dorsal sesamoids	26 Calcaneal tuberosity
3 Distal tibiofibular joint	16 Proximal interphalangeal joint	27 Sulcus for flexors
4 Lateral malleolus	17 Proximal phalanx	28 Plantar process of 9
5 Trochlea } of talus	18 Middle phalanx	29 First } tarsal bone
6 Body }	19 Distal interphalangeal joint	30 Second }
7 Calcaneus		31 First } metatarsal bone
8 Calcaneal tuberosity		32 Second }
		33 Third }

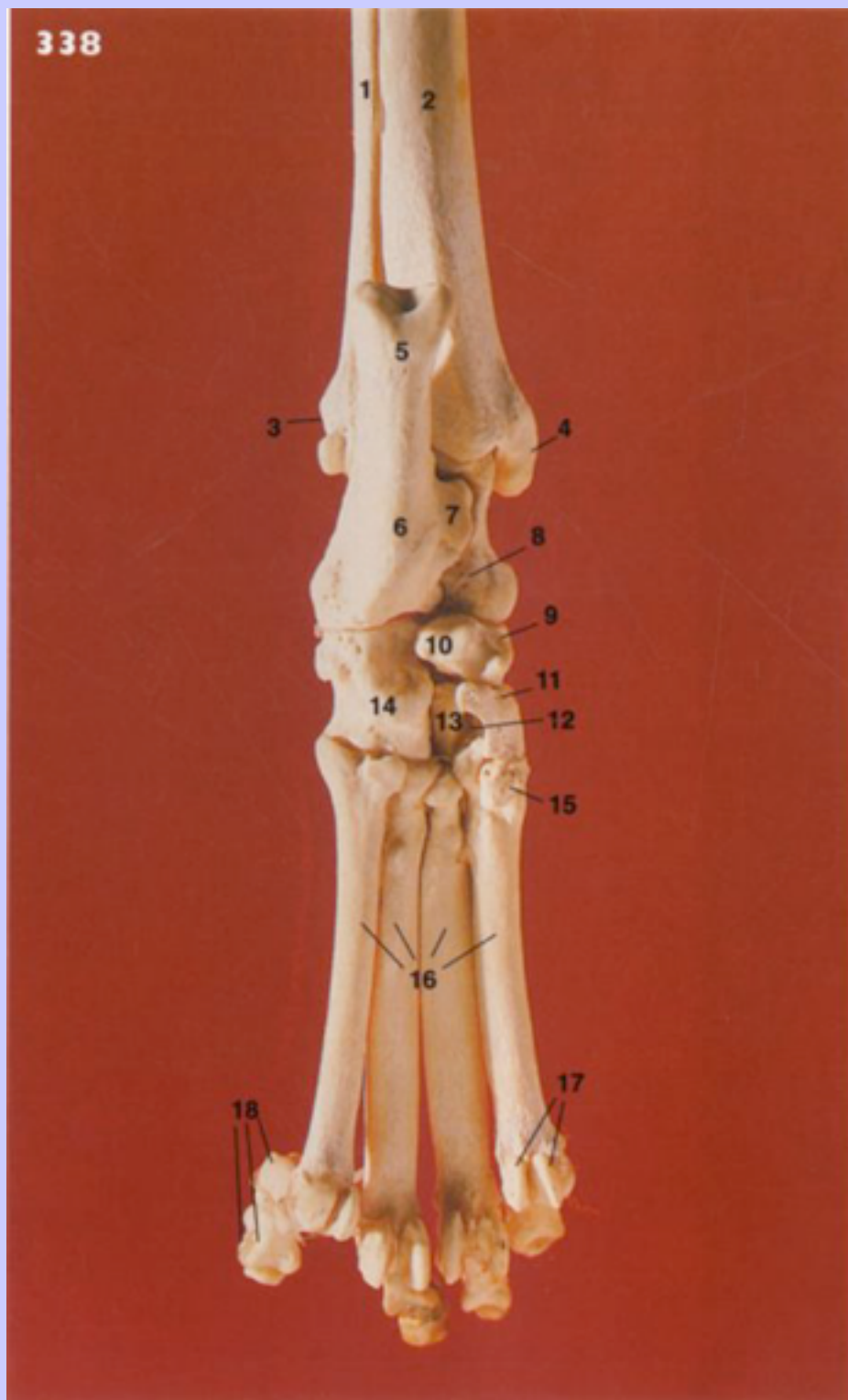
337 Mediolateral radiograph of the tarsal joint and pes of a dog.



1	Body of tibia	17	Medial malleolus
2	Body of fibula	18	Cochlea of tibia
3	Talus	19	Trochlea of talus
4	Calcaneus	20	Calcaneal tuberosity
5	Central	21	Sustenaculum tali
6	First	22	Proximal sesamoids
7	Second	23	Dorsal sesamoid
8	Third	24	Metatarsophalangeal
9	Fourth		joint
10	First metatarsal bone	25	Proximal phalanx
11	Second to fifth metatarsal bones	26	Middle phalanx
12	Talocrural joint	27	Distal phalanx
13	Proximal intertarsal joint	28	Proximal interphalangeal joint
14	Distal intertarsal joint	29	Distal interphalangeal joint
15	Tarsometatarsal joint	30	Ungual crest
16	Lateral malleolus		

205

338 Plantar aspect of the tarsal joint and pes of a dog.



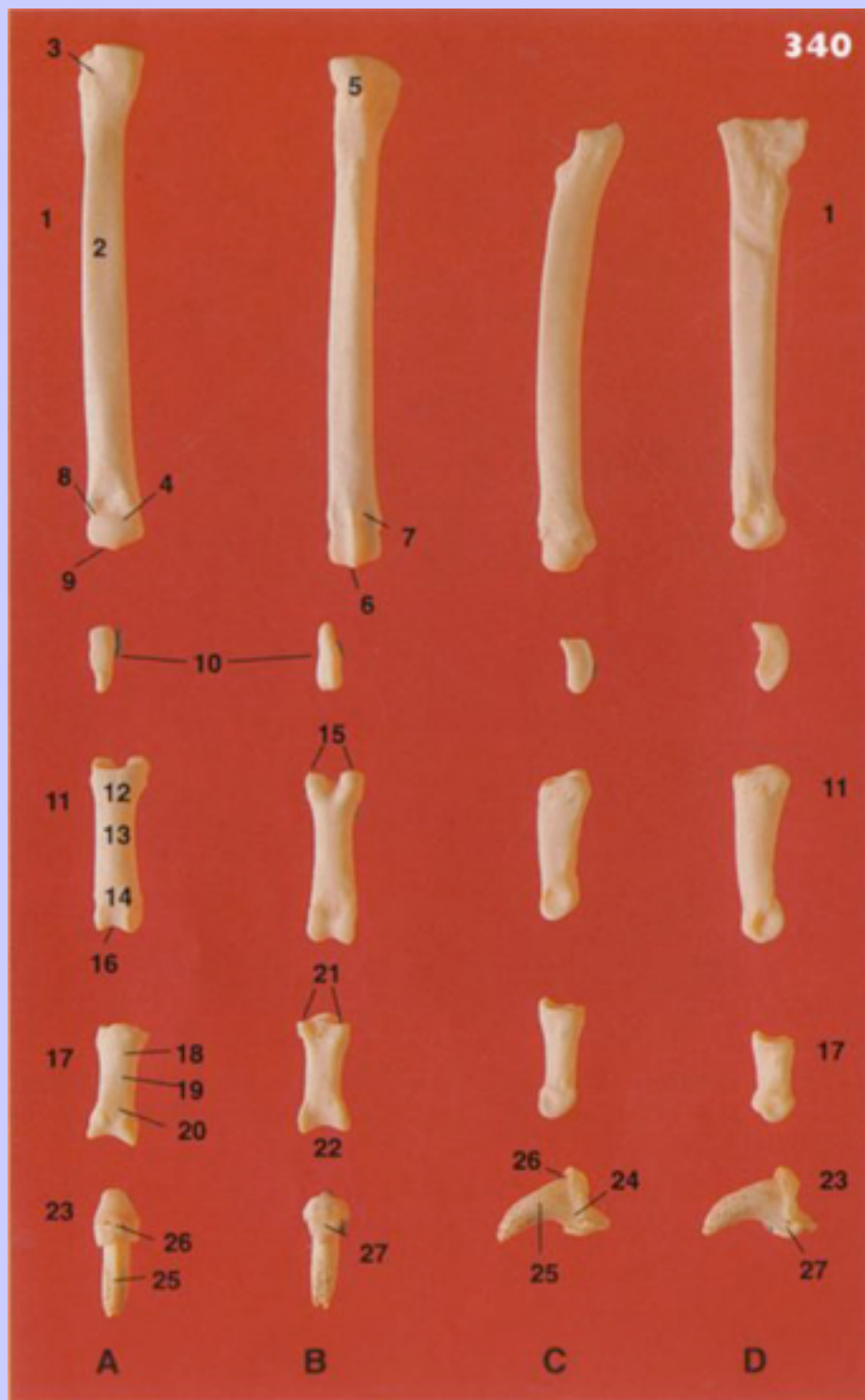
1	Fibula	11	First	} tarsal bone
2	Tibia	12	Second	
3	Lateral malleolus	13	Third	
4	Medial malleolus	14	Fourth	
5	Calcaneal tuberosity	15	First metatarsal bone	
6	Calcaneus	16	Second to fifth metatarsal bones	
7	Sustentaculum tali	17	Proximal sesamoids	
8	Talus	18	Proximal, middle and distal phalanges	
9	Central tarsal bone			
10	Plantar process of 9			

339 Dorsoplantar radiograph of the tarsal joint and pes of a dog.



- 1 Body of tibia
- 2 Body of fibula
- 3 Talus
- 4 Calcaneus
- 5 Central } tarsal bone
- 6 First }
- 7 Second }
- 8 Third }
- 9 Fourth }
- 10 First } metatarsal bone
- 11 Second }
- 12 Third }
- 13 Fourth }
- 14 Fifth }
- 15 Talocrural joint
- 16 Proximal intertarsal joint
- 17 Distal intertarsal joint
- 18 Tarsometatarsal joint
- 19 Lateral malleolus
- 20 Medial malleolus
- 21 Dorsal border
- 22 Lateral groove } of cochlea
- 23 Medial groove } of tibia
- 24 Lateral ridge } of trochlea
- 25 Medial ridge } of talus
- 26 Groove
- 27 Calcaneal tuberosity
- 28 Sustentaculum tali
- 29 Proximal sesamoids
- 30 Metatarsophalangeal joint
- 31 Outline of metatarsal pad
- 32 Proximal phalanx
- 33 Proximal interphalangeal joint
- 34 Middle phalanx
- 35 Distal interphalangeal joint
- 36 Distal phalanx
- 37 Ungual crest
- 38 Ungual process

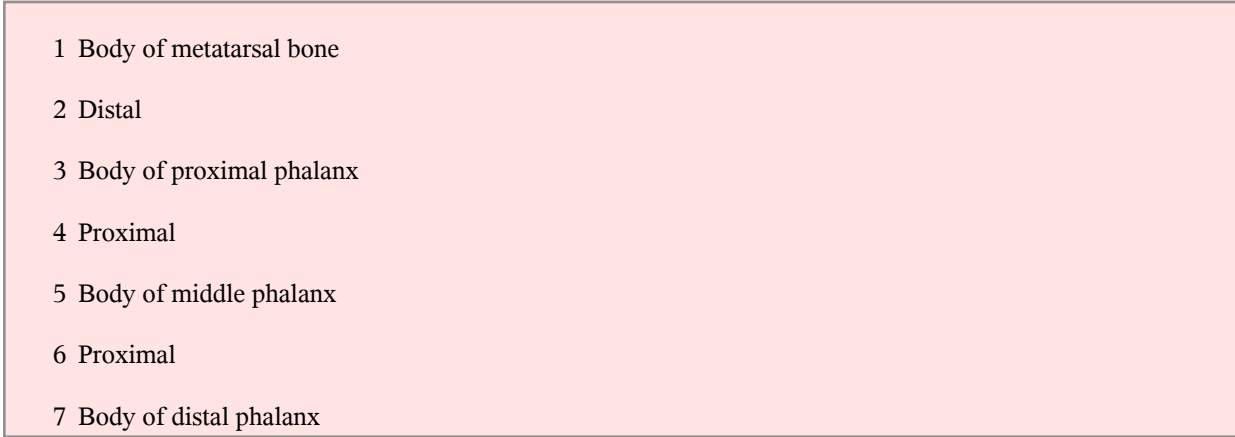
340 Dorsal (A), plantar (B), abaxial (C) and axial (D) aspects of a typical digit in the pes of a dog.



1 Metatarsal bone	17 Middle phalanx	
2 Body	18 Base	} of 17
3 Base	19 Body	
4 Head	20 Head	
5 Plantar tubercles	21 Plantar tubercles	
6 Sagittal crest	22 Trochlea	
7 Proximal sesamoid impression	23 Distal phalanx	
8 Dorsal sesamoid fossa	24 Body of 23	
9 Trochlea of I	25 Ungual process	
10 Proximal sesamoid	26 Ungual crest	
11 Proximal phalanx	27 Insertion of M. flexor digitorum profundus	
12 Base		
13 Body		
14 Head		} of 11
15 Plantar tubercles		
16 Trochlea		

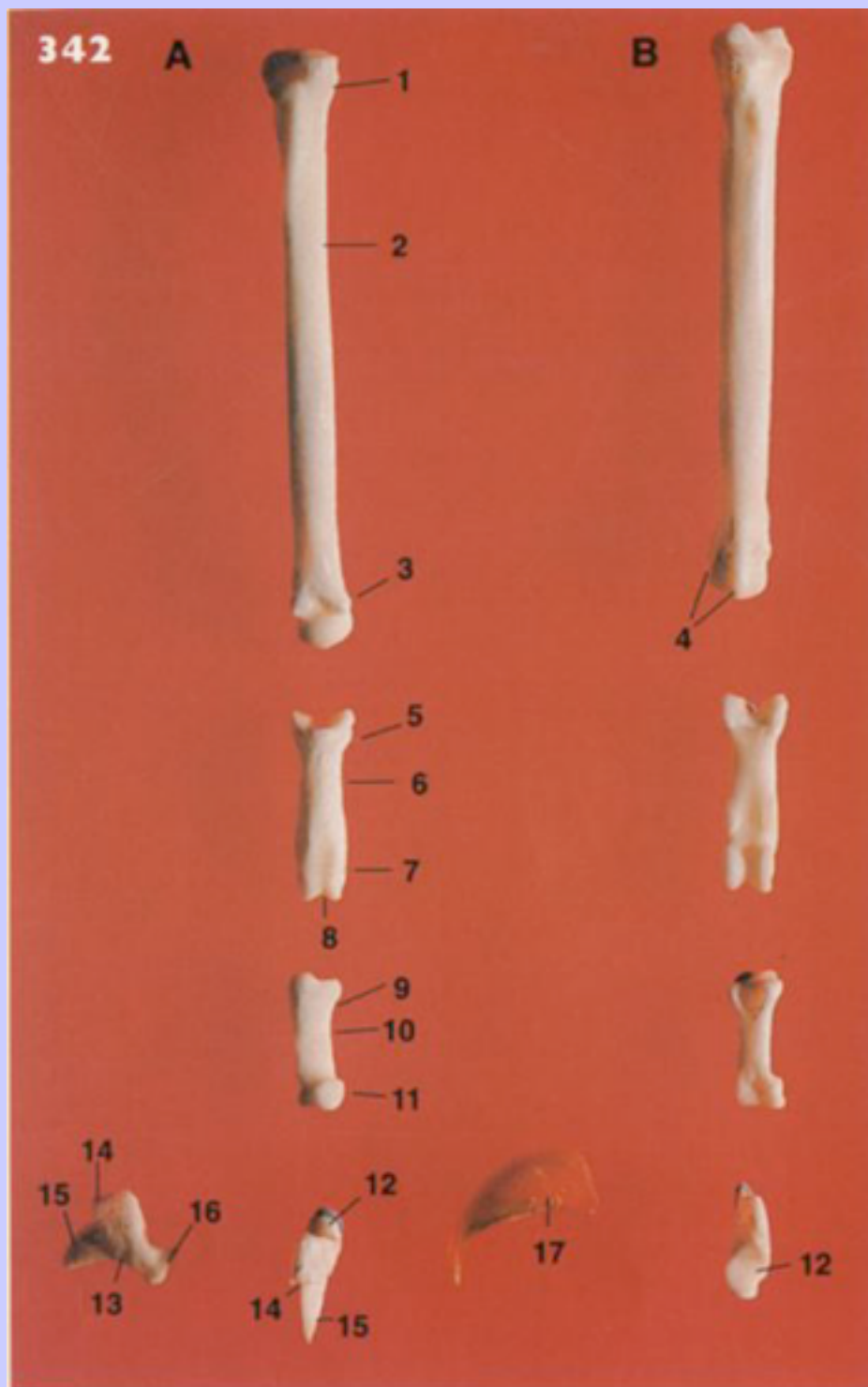
341 Dorsal aspect of a typical digit in the pes of a dog, showing the centres of ossification.



- 
- 1 Body of metatarsal bone
 - 2 Distal
 - 3 Body of proximal phalanx
 - 4 Proximal
 - 5 Body of middle phalanx
 - 6 Proximal
 - 7 Body of distal phalanx

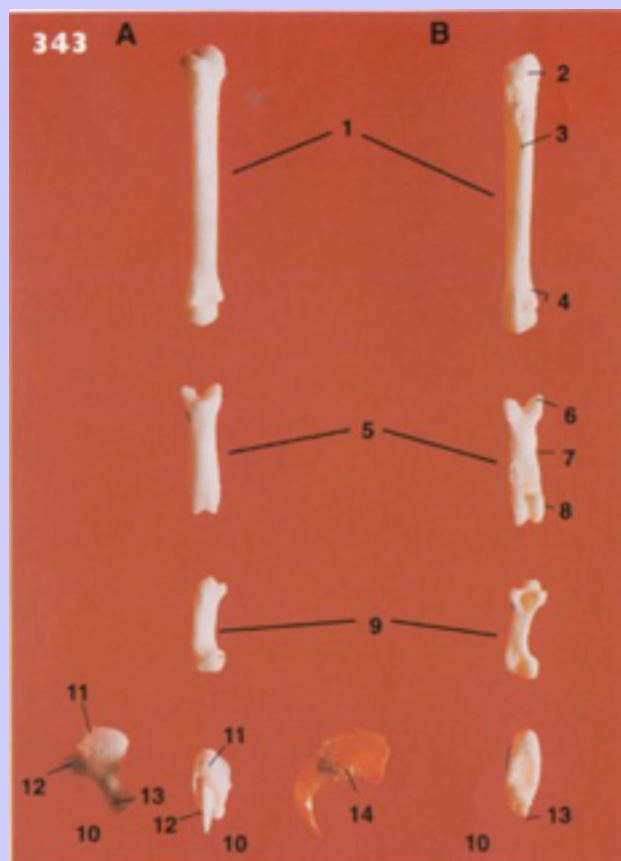
207

342 Dorsal (A) and plantar (B) aspects of a typical digit in the pes of a cat. The lateral aspects of the distal phalanx and the claw are also displayed.



- | | | | | | |
|----|---------------------|-----------------------|----|--|---------------------|
| 1 | Base | } of metatarsal bone | 12 | Base | } of distal phalanx |
| 2 | Body | | 13 | Body | |
| 3 | Head | | 14 | Ungual crest | |
| 4 | Sesamoid impression | | 15 | Ungual process | |
| 5 | Base | } of proximal phalanx | 16 | Tubercle for insertion of M.
flexor digitorum profundus | |
| 6 | Body | | 17 | Claw (unguis) | |
| 7 | Head | | | | |
| 8 | Trochlea | | | | |
| 9 | Base | | | | |
| 10 | Body | } of middle phalanx | | | |
| 11 | Head | | | | |

343 Dorsal (A) and palmar (B) aspects of a typical digit in the manus of a cat. The lateral aspects of the distal phalanx and the claw are also displayed.



- | | |
|-----------------------------|-------------------------------|
| 1 Metacarpal bone | 9 Middle phalanx |
| 2 Base } of metacarpal bone | 10 Distal phalanx |
| 3 Body } | 11 Ungual crest |
| 4 Head } | 12 Ungual process |
| 5 Proximal phalanx | 13 Tubercle for insertion of |
| 6 Base } of first phalanx | M. flexor digitorum profundus |
| 7 Body } | 14 Claw (unguis) |
| 8 Head } | |

208

209

344 Lateral aspect of the pelvic and thigh regions of the left pelvic limb of a cat.



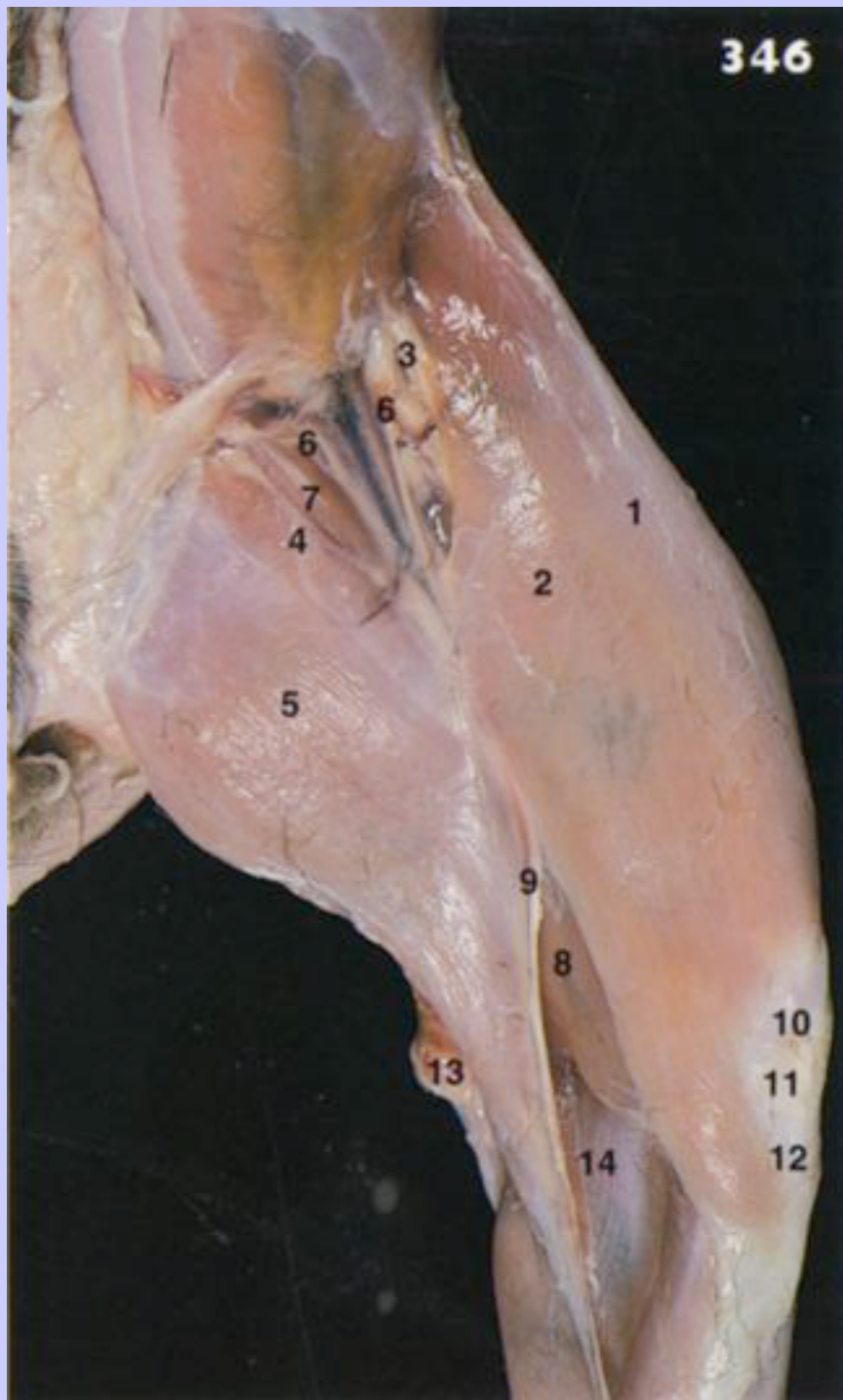
- 1 M. gluteus superficialis
- 2 M. gluteus medius
- 3 M. caudofemoralis
- 4 M. biceps femoris
- 5 M. tensor fasciae latae
- 6 Fascia lata
- 7 M. vastus lateralis
- 8 Greater trochanter
- 9 M. sartorius
- 10 Patella

345 Lateral aspect of the crus and pes of the left pelvic limb of a cat.



- 1 Tendon of M. biceps femoris
- 2 M. semitendinosus
- 3 M. gastrocnemius
- 4 M. flexor digitorum superficialis
- 5 M. soleus
- 6 M. peroneus longus
- 7 M. extensor digitorum longus
- 8 M. tibialis cranialis
- 9 Tendo calcaneus communis (Achilles)
- 10 M. peroneus brevis
- 11 Distal extensor retinaculum
- 12 Calcaneal tuberosity
- 13 Mm. interossei
- 14 M. extensor digitorum brevis

346 Medial aspect of the pelvic and thigh regions of the left pelvic limb of a cat.



1 Cranial part of M. sartorius

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- 2 Caudal part of M. sartorius
- 3 Tendon of M. rectus femoris
- 4 Mm. adductores
- 5 M. gracilis
- 6 Femoral triangle (with femoral artery, vein and saphenous nerve)
- 7 M. pectineus
- 8 M. semimembranosus
- 9 Medial saphenous vein
- 10 Patella
- 11 Patellar ligament
- 12 Tibial tuberosity
- 13 Popliteal lymph node
- 14 M. gastrocnemius

209

347 Mediolateral radiograph of the thigh region, stifle and tarsal joint of a puppy, showing the centres of ossification.



- | | | |
|---------------------------------|------------------------------|-------------|
| 1 Head of femur | 9 Body of tibia | |
| 2 Greater trochanter | 10 Proximal epiphysis | |
| 3 Lesser trochanter | 11 Body | } of fibula |
| 4 Body | 12 Distal epiphysis | |
| 5 Distal epiphysis | 13 Distal epiphysis of tibia | |
| 6 Patella | 14 Body of calcaneus | |
| 7 Proximal tibial epiphysis | 15 Calcaneal tuberosity | |
| 8 Cranial border (tibial crest) | | |

7.0.8

Clinical Note

- 8 The tibial crest has its own centre of ossification separated from the body by a cartilaginous growth plate. As the tendon of insertion of the M. quadriceps inserts here by means of the straight patellar ligament, this centre can become distracted from the body – requiring surgical correction.

348 Mediolateral radiograph of the tarsal joint and pes of a puppy, showing the centres of ossification.



1	Distal epiphysis of tibia	7	Body	} of proximal phalanx
2	Distal epiphysis of fibula	8	Proximal epiphysis	
3	Body of calcaneus	9	Body	} of middle phalanx
4	Calcaneal tuberosity	10	Proximal epiphysis	
5	Body } of	11	Body of distal phalanx	
6	Distal epiphysis } metatarsus			

7.0.9

Clinical Note

- 4 The calcaneal tuberosity has its own centre of ossification separated from the body of the calcaneus by a growth plate. As the common calcanean tendon inserts here, this centre can become distracted from the body – requiring surgical correction.

210

349 Craniocaudal dorsoplantar radiograph of the stifle and tarsal joint of a puppy, showing the centres of ossification.

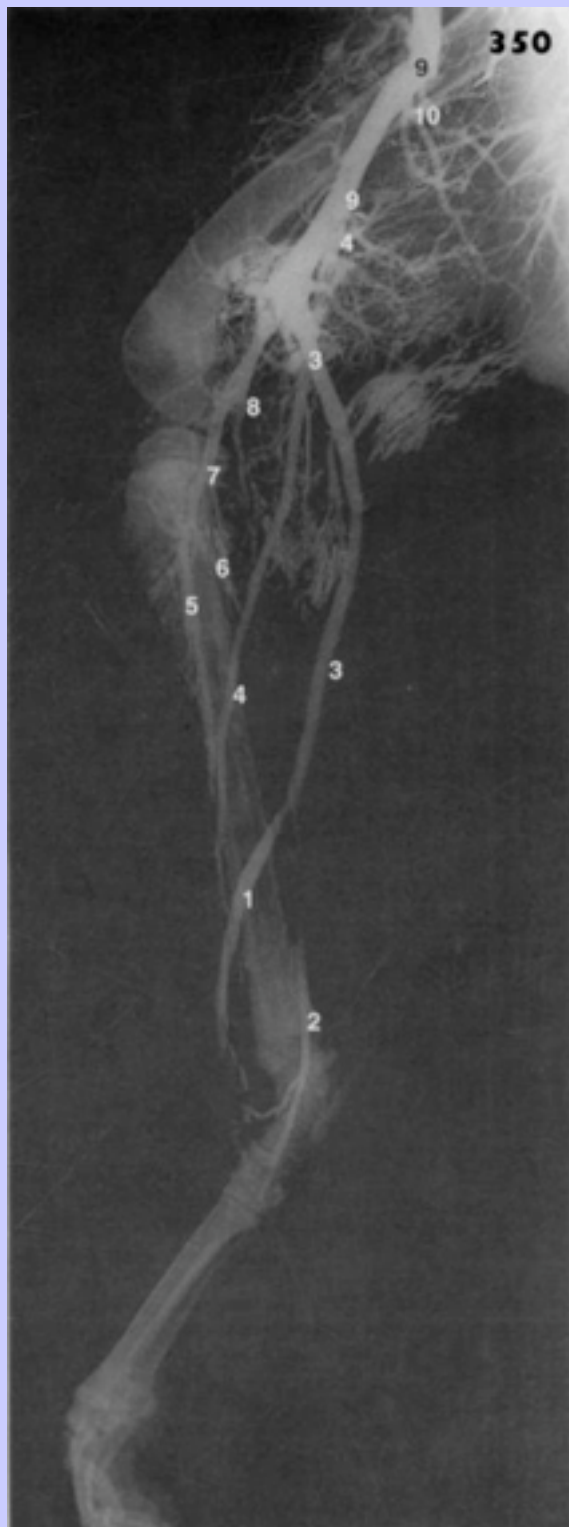
211





- | | | |
|----|------------------------------|------------|
| 1 | Body | } of femur |
| 2 | Distal epiphysis | |
| 3 | Patella | |
| 4 | Proximal epiphysis of tibia | |
| 5 | Proximal epiphysis of fibula | |
| 6 | Body of tibia | |
| 7 | Body of fibula | |
| 8 | Calcaneal tuberosity | |
| 9 | Distal epiphysis of tibia | |
| 10 | Distal epiphysis of fibula | |
| 11 | Body of metatarsus | |
| 12 | Distal epiphysis | |

350 Mediolateral radiograph of a venogram of the pelvic limb of a dog.



- 1 Cranial branch } of lateral
- 2 Caudal branch } saphenous vein
- 3 Lateral saphenous vein
- 4 Medial saphenous vein
- 5 Cranial tibial vein
- 6 Caudal tibial vein
- 7 Popliteal vein
- 8 Distal caudal femoral vein
- 9 Femoral vein
- 10 Deep femoral vein

211

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351 Mediolateral radiograph of an arteriogram of the pelvic limb of a dog.



1	Caudal gluteal artery from internal iliac artery	8	Distal caudal femoral artery
2	Femoral artery from external iliac artery	9	Popliteal artery
3	Lateral circumflex femoral artery	10	Caudal tibial artery
4	Proximal caudal femoral artery	11	Cranial tibial artery
5	Saphenous artery	12	Perforating metatarsal artery
6	Descending genicular artery	13	Caudal branch } of 5
7	Middle caudal femoral artery	14	Cranial branch }
		15	Plantar metatarsal arteries
		16	Plantar common digital arteries
		17	Plantar proper digital arteries